

New and interesting mites
from the Geneva Museum LXI.*
Oribatids from Sabah (East Malaysia) III
(Acari: Oribatida)

by

S. MAHUNKA **

With 133 figures

ABSTRACT

New and interesting mites from the Geneva Museum LXI. Oribatids from Sabah (East Malaysia) III (Acari: Oribatida). — 74 species of Oribatid mites from Sabah (East Malaysia) are listed and discussed, 39 of them are described as new to science. Redescriptions or complementary descriptions of the following 4 species are given: *Nanhermannia fenneri* Balogh, 1970, *Berlesezetes ornatissimus* (Berlese, 1913), *Allozetes pusillus* Berlese, 1913 and *Allozetes africanus* Balogh, 1958. & new genera are erected: *Ikarotocepheus* gen. n., *Bulbocepheus* gen. n., *Archegotocepheus* gen. n. (*Otocepheidae*), *Foveolatoppia* gen. n. (*Oppiidae*), *Suctobelbiloides* gen. n. (*Suctobelbidae*), *Bischeloribates* gen. n., *Coronibatula* gen. n. (*Scheloribatidae*), *Aokibates* gen. n. (*Haplozetidae*).

INTRODUCTION

The present third contribution is a continuation of my earlier works (MAHUNKA 1987a, 1987b) concerning the Oribatid fauna of Sabah. This part comprises the elaboration of some soil samples collected by Dr. B. Hauser on his second trip to Sabah (East Malaysia), in company of Dr. C. Lienhard.

* Etant donné que la majorité des articles parus ces dernières années sont rédigés en anglais, l'auteur a pris l'initiative de traduire le titre général, dès ce numéro.

** Zoological Department, Hungarian Natural History Museum, Baross utca 13, H-1088 Budapest, Hungary.

Until now seventy-four species could be identified within this very rich material, 39 of them are here described as new for science, eight also representing new genera: *Ikarotocephus*, *Bulbocephus*, *Archegottocephus* (family Otocephelidae), *Foveolatoppia* (family Oppiidae), *Suctobelbiloides* (family Suctobelbidae), *Bischeloribates*, *Coronibatula* (family Scheloribatidae), *Aokibates* (family Haplozetidae). The very interesting and little known species *Berlesezetes ornatissimus* (Berlese, 1913) and *Allozetes pusillus* Berlese, 1913 are redescribed.

The examination of the material from Sabah will be continued before long, therefore, I do not wish to discuss now any zoogeographical or important systematic problem, arising in connection with this material; they will be summarized after the full elaboration.

I wish to express my special thanks to Dr. B. Hauser for giving me the opportunity to study this very rich and interesting material and for his continuous help in my work and in the correction of my manuscript. I thank also L. Zombori (Budapest) for the linguistic revision.

LIST OF LOCALITIES

- Pal-83/5: Sabah (Sandakan Residency): Kolapis: à 70 km de Sandakan sur la route en direction de Ranau (entre "Checkpoint 30 miles" et Telupid), forêt dégradée, 60 m, prélèvement de sol, leg. B. Hauser; 12.III.1983 (B⁺)
- Pal-83/8: Sabah (Sandakan Residency): 15 milles (24 km) à l'ouest de Sandakan: Sepilok: "Kabili-Sepilok Forest Reserve" (KSFR), forêt près de l'"Orang-Utan Rehabilitation Station" (OURS), 30 m, prélèvement de sol dans les angles formés par les contreforts de *Eusideroxylon zwageri* et *Pometia pinnata*; leg. B. Hauser, 12.III.1983 (B)
- Pal-83/13: Sabah (Interior Residency): route de Kimanis, à 16 milles de Keningau: heliport, prélèvement de sol en forêt brumeuse, 1380 m; leg. B. Hauser, 14.III.1983 (B)
- Pal-83/36: Sabah (West Coast Residency): Mt Kinabalu: "Bukit Ular Trail" (sentier reliant la "Power Station" à la "Kambarangan Road"), prélèvement de sol en forêt de *Lithocarpus-Castanopsis*, 1780 m; leg. B. Hauser, 20.III.1983 (B)
- Pal-83/40: Sabah (West Coast Residency): Mt Kinabalu: Poring Hot Springs (43 km à l'est de Park Headquarters): près des cascades "Kipungit Falls", prélèvement de sol, 530 m, leg. B. Hauser; 21.III.1983 (B)
- Pal-83/43: Sabah (West Coast Residency): Mt Kinabalu: Poring Hot Springs: "Langanan Trail", sentier entre la bifurcation pour les "Kipungit Falls" et les "Bat Caves", prélèvement de sol, 600 m; leg. B. Hauser, 21.III.1983 (B)

LIST OF SPECIES

Hypochthoniidae Berlese, 1910

Eohypochthonius salicifolius Hammer, 1979

L o c a l i t y : Pal-83/5: 6 specimens

Malacoangelia remigera Berlese, 1913

L o c a l i t i e s : Pal-83/5: 2 specimens; Pal-83/8: 2 specimens; Pal-83/43: 1 specimen

⁺B: extraction par appareil BERLESE.

Mesoplophoridae Ewing, 1917

- Apoplophora heterotricha* Mahunka, 1987
L o c a l i t y : Pal-83/5: 10 specimens
- Apoplophora ornatissima* sp. n.
L o c a l i t y : Pal-83/8
- Apoplophora spinosa* Mahunka, 1987
L o c a l i t y : Pal-83/5: 3 specimens

Lohmanniidae Berlese, 1916

- Cryptacarus schauenbergi* Mahunka, 1972
L o c a l i t y : Pal-83/43: 16 specimens
- Haplacarus rugosus* Mahunka, 1987
L o c a l i t i e s : Pal-83/5: 3 specimens; Pal-83/8: 4 specimens
- Javacarus porosus* Hammer, 1979
L o c a l i t i e s : Pal-83/8: 5 specimens; Pal-83/43: 2 specimens
- Meristacarus glabrisetus* sp. n.
L o c a l i t i e s : Pal-83/5; Pal-83/8
- Millotacarus orientalis* sp. n.
L o c a l i t i e s : Pal-83/5; Pal-83/8
- Vepracarus ramosus* Balogh, 1961
L o c a l i t y : Pal-83/43: 1 specimen

Epilohmanniidae Oudemans, 1923

- Epilohmannia flagellifer* Mahunka, 1987
L o c a l i t y : Pal-83/8: 5 specimens
- Epilohmannia pallida pacifica* Aoki, 1965
L o c a l i t i e s : Pal-83/5: 2 specimens; Pal-83/43: 16 specimens

Phthiracaridae Perty, 1841

- Hoplophorella cucullata* (Ewing, 1909)
L o c a l i t y : Pal-83/8: 2 specimens

Oribotritiidae Grandjean, 1954

- Berndotritia bulbifer* Mahunka, 1987
L o c a l i t y : Pal-83/8: 3 specimens

Sabahtritiidae Mahunka, 1987

- Sabahtritia hauseri* Mahunka, 1987
L o c a l i t y : Pal-83/8: 3 specimens

Nanhermanniidae Sellnick, 1928*Nanhermannia pluriseta* sp. n.

L o c a l i t y : Pal-83/13

Hermanniidae Sellnick, 1928*Hermannia fungifer* sp. n.

L o c a l i t i e s : Pal-83/5; Pal-83/8

Hermannia heterotricha sp. n.

L o c a l i t y : Pal-83/8

Microzetidae Grandjean, 1936*Berlesezetes ornatissimus* (Berlese, 1913)

L o c a l i t y : Pal-83/43: 6 specimens

Microzetes fimbriatus sp. n.

L o c a l i t y : Pal-83/43

Microzetes tuberculatus Mahunka, 1987

L o c a l i t i e s : Pal-83/8: 1 specimen; Pal-83/43: 1 specimen

Eremobelbidae Balogh, 1961*Eremobelba comteae* sp. n.

L o c a l i t y : Pal-83/8

Eremobelba heterotricha Mahunka, 1977

L o c a l i t y : Pal-83/8: 2 specimens

Heterobelbidae Balogh, 1961*Heterobelba galerulata* Berlese, 1913

L o c a l i t i e s : Pal-83/5: 6 specimens; Pal-83/8: 2 specimens; Pal-83/13: 6 specimens

Metrioppiidae Balogh, 1943*Furcoppia horakae* Mahunka, 1987

L o c a l i t y : Pal-83/8: 16 specimens

Carabodidae C. L. Koch, 1837*Berndobodes spiculifer* Mahunka, 1986

L o c a l i t y : Pal-83/36

Hardibodes mirabilis Balogh, 1970

L o c a l i t y : Pal-83/8: 1 specimen

Yoshiobodes arcuatus Mahunka, 1987

L o c a l i t y : Pal-83/8: 2 specimens

Otocepheidae Balogh, 1961

- Archegotocepheus singularis* gen. n., sp. n.
Localities: Pal-83/5; Pal-83/8
- Bulbocepheus hauserorum* gen. n., sp. n.
Locality: Pal-83/13
- Dolicheremaeus sabahnus* sp. n.
Localities: Pal-83/8; Pal-83/13
- Ikarotocepheus alatus* gen. n., sp. n.
Locality: Pal-83/13
- Leptotocepheus orientalis* sp. n.
Locality: Pal-83/8

Oppiidae Grandjean, 1954

- Arcoppia robusta* sp. n.
Localities: Pal-83/5; Pal-83/8
- Arcoppia sabahensis* sp. n.
Locality: Pal-83/8
- Foveolattoppia foveolata* gen. n., sp. n.
Localities: Pal-83/5; Pal-83/8
- Interoppia mirabilis* Mahunka, 1987
Locality: Pal-83/5: 2 specimens
- Oppia minutissima* Sellnick, 1950
Locality: Pal-83/43: 1 specimen
- Oppiella nova* (Oudemans, 1902)
Localities: Pal-83/36: 7 specimens; Pal-83/40: 3 specimens
- Papillonotus hauseri* sp. n.
Locality: Pal-83/8
- Pulchroppia burckhardti* Mahunka, 1987
Locality: Pal-83/8: 2 specimens
- Pulchroppia elegans* sp. n.
Localities: Pal-83/8; Pal-83/13
- Ramusella pinifera* sp. n.
Locality: Pal-83/43
- Striatoppia modesta* sp. n.
Locality: Pal-83/8

Suctobelbidae Grandjean, 1954

- Suctobelbella foliosa* sp. n.
Locality: Pal-83/13
- Suctobelbella sabahensis* sp. n.
Localities: Pal-83/8; Pal-83/13

Suctobelbilla baderi sp. n.

Localities: Pal-83/13

Suctobelbilla scutata Hammer, 1972

Localities: Pal-83/8: 4 specimens; Pal-83/13: 1 specimen

Suctobelbiloides armatus gen. n., sp. n.

Localities: Pal-83/13

Oxyameridae Aoki, 1965

Oxyamerus hauserorum Mahunka, 1987

Localities: Pal-83/5: 3 specimens

Arceremaeidae Balogh, 1972

Tecteremaeus incompletus sp. n.

Localities: Pal-83/8

Machadobelbidae Balogh, 1972

Machadobelba descombesi sp. n.

Localities: Pal-83/8

Machadobelba similis sp. n.

Localities: Pal-83/13

Machadobelba spathulifer Mahunka, 1987

Localities: Pal-83/8: 9 specimens

Oribatulidae Thor, 1929

Tuberemaeus nagaii sp. n.

Localities: Pal-83/5; Pal-83/8

Scheloribatidae

Bischeloribates heterodactylus gen. n., sp. n.

Localities: Pal-83/8

Coronibatula lienhardi gen. n., sp. n.

Localities: Pal-83/5; Pal-83/8

Scheloribates aelleni sp. n.

Localities: Pal-83/8

Haplozetidae Grandjean, 1936

Aokibates yoshii gen. n., sp. n.

Localities: Pal-83/5; Pal-83/8

Magyaria javensis Hammer, 1979

Locality: Pal-83/5: 3 specimens

Magyaria triungulata sp. n.

Locality: Pal-83/13

Nixozetes (Philippizetes) corpusrarosi Mahunka, 1987

Localities: Pal-83/5: 3 specimens; Pal-83/8: 8 specimens

Phalacrozetes similis sp. n.

Localities: Pal-83/5; Pal-83/8

Xylobates bisculpturatus sp. n.

Localities: Pal-83/5; Pal-83/8

Xylobates duoseta Hammer, 1979

Locality: Pal-83/8: 1 specimen

Xylobates paracapucinus sp. n.

Localities: Pal-83/5; Pal-83/8

Xylobates rodriguezii sp. n.

Locality: Pal-83/8

Ceratozetidae Jacot, 1925

Allozetes pusillus (Berlese, 1913)

Locality: Pal-83/8: 1 specimen

Oribatellidae Jacot, 1925

Lamellobates orientalis Csiszár, 1961

Localities: Pal-83/5: 3 specimens; Pal-83/8: 2 specimens

Oribatella malaya Balogh et Mahunka, 1974

Locality: Pal-83/8: 1 specimen

Epactozetidae Grandjean, 1930

Truncozetes tunicatus Berlese, 1913

Locality: Pal-83/43: 2 specimens

Galumnidae Jacot, 1925

Allogalumna incompleta sp. n.

Locality: Pal-83/8

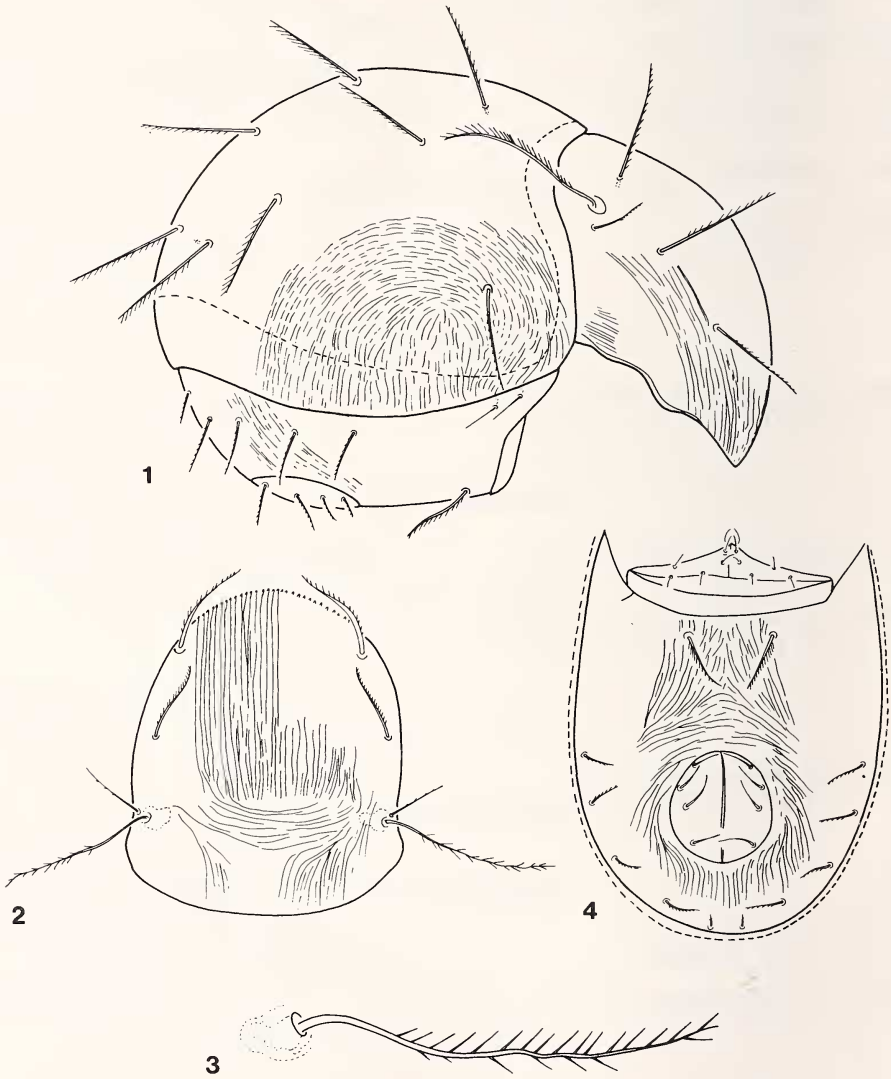
Pergalumna quadrimaculata sp. n.

Locality: Pal-83/8

DESCRIPTIONS

Apoplophora ornatissima sp. n.

M e a s u r e m e n t s : Length of aspis: 327-346 μm , length of notogaster: 371-406 μm , height of notogaster: 257-277 μm .



FIGS 1-4.

Apoplophora ornatissima sp. n. — 1: body from lateral view, 2: aspis, 3: sensillus, 4: ventral side.

A s p i s (Fig. 2): Rostrum very wide. Prodorsal surface ornamented by parallel fine ribs, which run longitudinally in the anterior part of prodorsum, some transversal lines in the interbothridial region, and again longitudinal ribs on the basal part of prodorsum. Sensillus (Fig. 3) slightly waved, with 22-25 long, thin cilia. Prodorsal setae strong, setae *le* longer than setae *in*.

“*N o t o g a s t e r*” (Fig. 1): Notogastral setae nearly equal in length, their cilia very long — excepting seta c_3 — the last cilia longer than the tip of setae. Notogastral surface also ornamented by fine ribs, their lines compose a typical semicircle formation laterally, its centre located near to seta c_3 .

V e n t r a l s i d e (Fig. 4): Surface ornamented also by fine ribs, formation is shown in Fig. 4. Five pairs of “ventral” setae in adanal position, the posteromarginal setae much shorter than the others. One pair of stronger setae between the anal and genital opening, and two pairs of very thin and simple setae in “aggenital” position.

M a t e r i a l e x a m i n e d: Holotype: Pal-83/8; 14 paratypes: from the same sample. Holotype and 9 paratypes: MHNG¹, 5 paratypes (989-PO-84): HNHM².

R e m a r k s: In the genus *Apoplophora* Aoki, 1980 the new species is the single one with ornamented notogastral surface.

***Meristacarus glabrisetus* sp. n.**

M e a s u r e m e n t s: Length: 656-705 μm , width: 437-462 μm .

D o r s a l s i d e (Fig. 5): Rostrum widely rounded, sometimes slightly convex. All prodorsal setae thin and simple, completely smooth. Great differences among their length, both pairs of exobothridial setae only half as long as setae *ro*, but *exa* < *exp*. Sensillus with 7-8 long branches. All notogastral setae thin and smooth, setae c_1 , c_2 , d_1 , d_2 , e_1 and e_2 short, setae f_1 and h_1 nearly three times longer than these. Fossulae vittiformes between setae d_1 composing a nearly cordiform pattern.

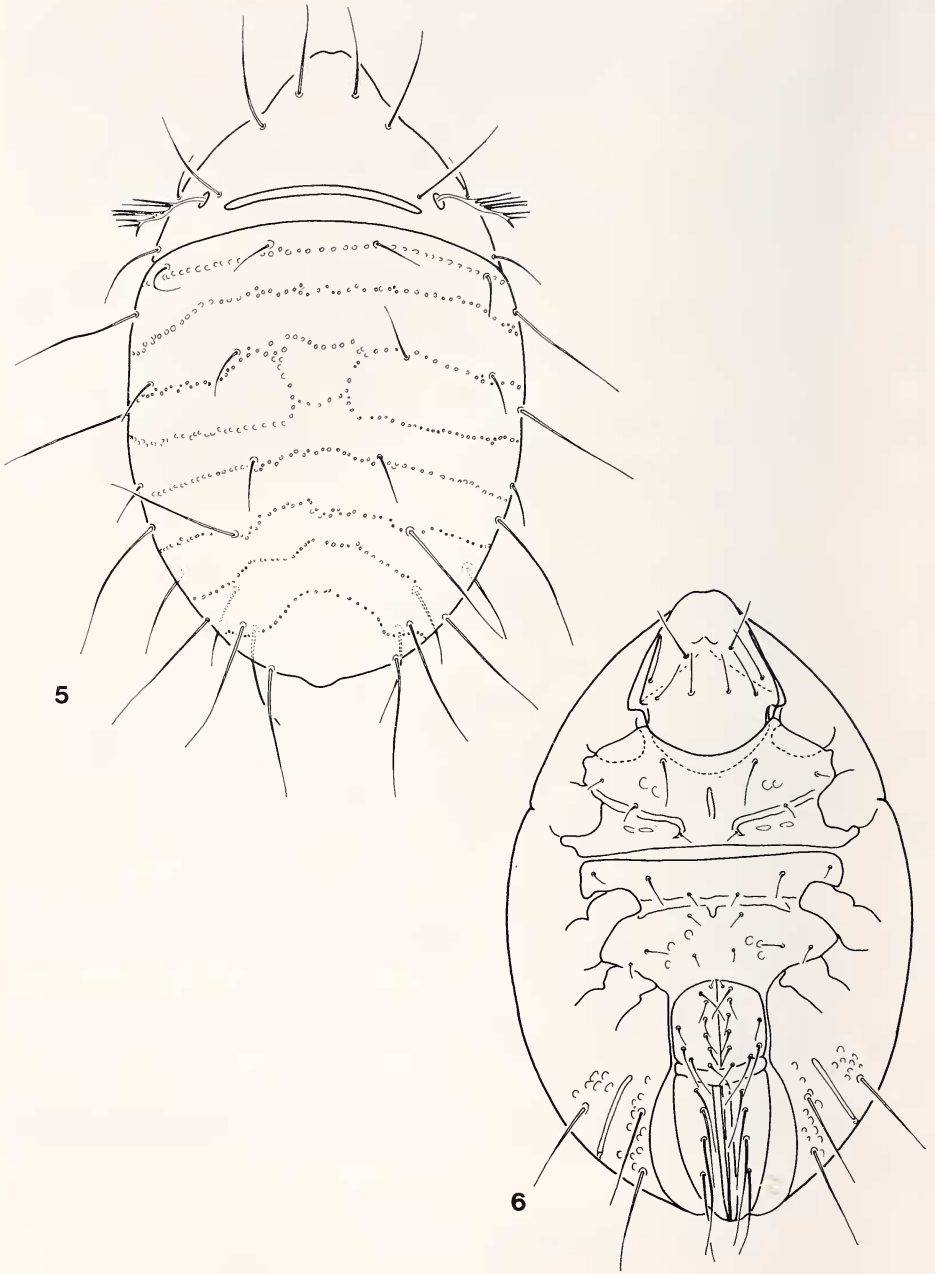
V e n t r a l s i d e (Fig. 6): Epimeral setal formula: 3-1-3-4. Setae *1c* much longer than *1b*, *1c* or *2a*, and *3b* longer than all other setae on the third and fourth epimeres. Setae *3b* slightly pilose, all other smooth. Anogenital region similar to the other species of this genus, but all setae completely smooth.

M a t e r i a l e x a m i n e d: Holotype: Pal-83/8, 20 paratypes: from the same sample, 1 paratype: Pal-83/5. Holotype and 13 paratypes: MHNG, 8 paratypes (990-PO-84): HNHM.

R e m a r k s: The new species is well distinguished from all heretofore known *Meristacarus* Grandjean, 1934 species by the totally smooth prodorsal and notogastral setae.

¹ MHNG = deposited in the Muséum d'Histoire naturelle, Geneva.

² HNHM = deposited in the Hungarian Natural History Museum, Budapest, with identification number of the specimens in the Collection of Arachnida.



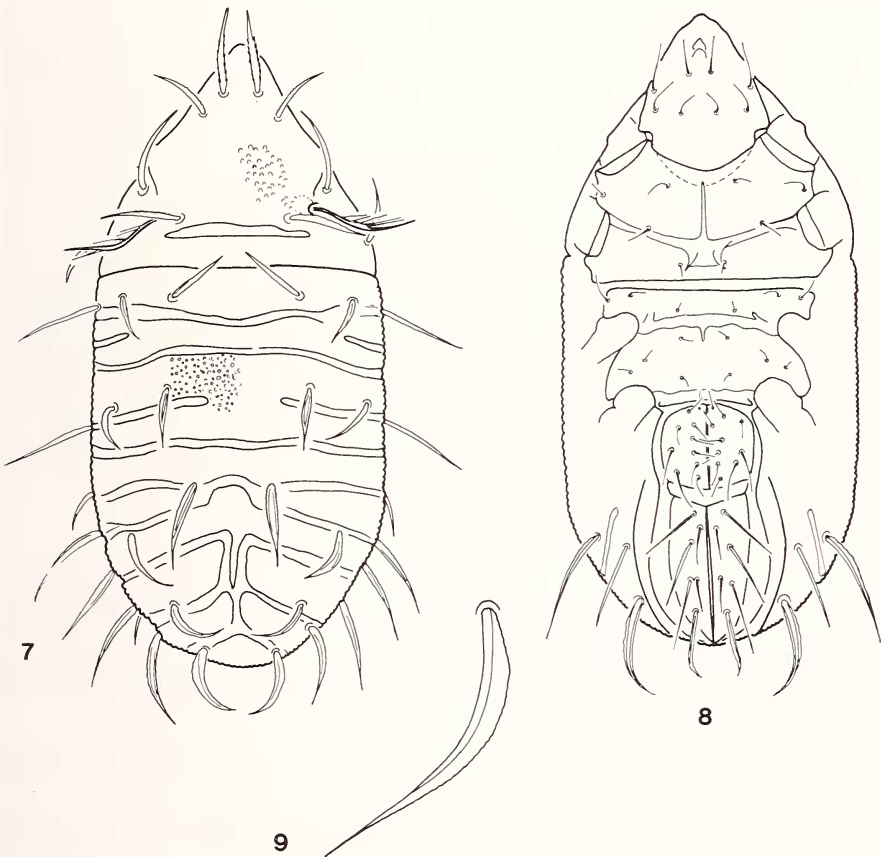
FIGS 5-6.

Meristacarus glabrisetus sp. n. — 5: dorsal side, 6: ventral side.

***Millotacarus orientalis* sp. n.**

M e a s u r e m e n t s : Length: 567-607 μm , width: 275-300 μm .

D o r s a l s i d e (Fig. 7): Rostrum rounded, convex. Prodorsal surface — excepting fossulae vittiformes — similar to the notogastral one, covered by secretion granules. Rostral setae slightly pilose, other setae serrated marginally or roughened. Sensillus with 7-8 long branches. Notogastral setae (Fig. 9) phylliform, but of different lengths and shapes. Setae h_1 and ps_1 strongly curved inwards, shorter and blunter than the others. Fossulae vittiformes of characteristic shape, S_1 , S_2 and S_3 a continuous transversal band, S_4 broken in the middle. S_6 and S_7 connected with each other, S_8 , S_9 and S_{10} also connected with a longitudinal band.



FIGS 7-9.

Millotacarus orientalis sp. n. — 7: dorsal side, 8: ventral side, 9: notogastral seta.

Ventral side (Fig. 8): Covered also with granules. Apodemes well developed, ap. 2 and sternal apodeme connected with each other, ap. 3 and ap. 4 also thick. All epimeral setae thin, only some of them finely barbed. Anogenital configuration typical for the genus, all aggenital setae thin and simple, both pairs of anal setae thin, setae ad_1 stronger, but not dilated, ad_2 , ad_3 and ad_4 slightly dilated, all roughened. Setae ad_4 blunter than the others.

Material examined: Holotype: Pal-83/8, 1 paratype: from the same sample, 6 paratypes: Pal-83/5. Holotype and 4 paratypes: MHNG, 3 paratypes (991-PO-84): HNHM.

Remarks: The genus *Millotacarus* Balogh, 1960 was described from Madagascar and heretofore only the type species was known. This new species is well ranked in this genus and is distinguished from the type (*M. granulatus* Balogh, 1960) by the much longer notogastral setae (e.g. f_1 or marginal setae) and by the shape of fossulae vittiformes.

***Nanhermannia pluriseta* sp. n.**

Measurements: Length: 530-555 μm , width: 242-252 μm .

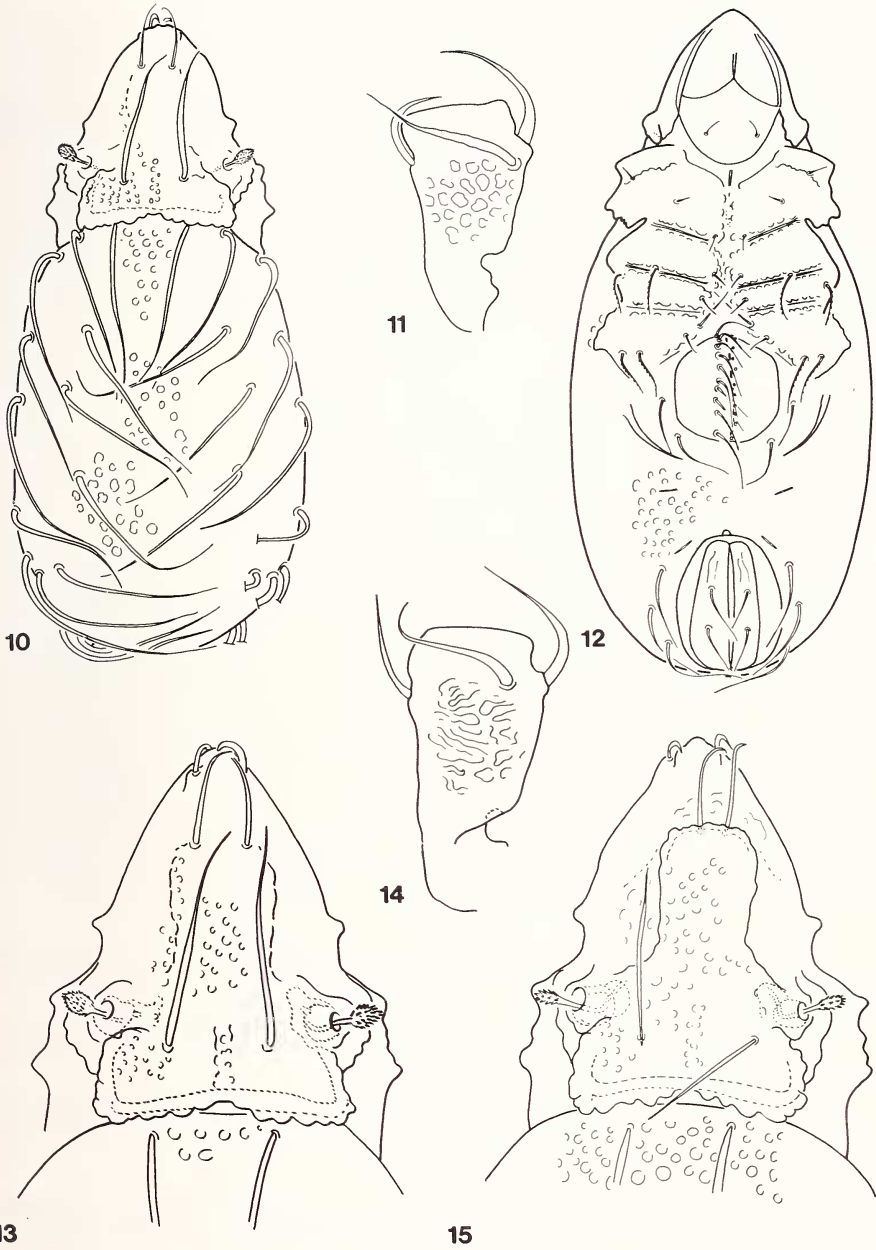
Dorsal side (Fig. 10): Central area of prodorsum ill-defined, border hardly observable. Its surface well foveolate, lateral part of prodorsum only with some foveolae giving an irregular sculpture. Rostral setae short but thick, arising on small tubercles. Lamellar setae long, reaching out to rostrum (Fig. 13). Interlamellar setae also very long, much longer than distance between the insertions of setae *le* and *in*. Sensillus very short, its head well dilated, its surface with many spicules. Prodorsal condyles wide, lath like, connected medially but between the two groups of condyles well-discernible hollow present. Both groups of condyles consisting of 5-6 rounded teeth. All notogastral setae arising one after the other. Surface ornamented by large foveolae, they are round on the anterior part, but with an irregular margin on posterior part of notogaster.

Ventral side (Fig. 12): Ventrolateral margin of prodorsum and posterior margin of epimere I with a chitinous plate covering the trochanter of legs I and II. Border between epimeral plates also strongly chitinized, with chitinous tubercles. Epimeral surface punctate, without foveolae. Epimeral setal formula: 3-1-3-4. Some of these setae (*3b*, *3c*, *4a*, *4d*) long and distinctly pilose. Ten pairs of strong genital setae, two pairs of aggenital, two pairs of anal and three pairs of adanal setae. All similar to notogastral setae.

Legs: Surface of femur of legs I-IV with large spots or foveolae, which compose a polygonal network.

Material examined: Holotype: Pal-83/13, 1 paratype: from the same sample. Holotype: MHNG, paratype (992-PO-84): HNHM.

Remarks: On the ground of the shape of notogastral condyles the new species belongs to the "*thaiensis*-group". It stands nearest to *N. fenneri* Balogh, 1970, however the two species are distinguished from each other by the following characters:



FIGS 10-15.

Nanhermannia pluriseta sp. n. — 10: dorsal side, 11: sculpture of femur I, 12: ventral side, 13: prodorsum.

Nanhermannia fenneri Balogh, 1970 — 14: sculpture of femur I, 15: prodorsum.

fenneri Balogh, 1970

1. Central part of prodorsum * well-defined by a border.
2. Interlamellar setae not reaching to insertion of setae *le* (Fig. 15).
3. Epimeral surface well foveolate.
4. Epimeral setal formula: 3-1-4-4.
5. Nine pairs ** of genital setae present.
6. Surface of femur of leg I with irregular ribs (Fig. 14).

pluriseta sp. n.

1. Central part ill-defined.
2. Interlamellar setae very long, reaching to insertion of seta *le*.
3. Epimeral surface only punctate.
4. Epimeral setal formula: 3-1-3-4.
5. Ten pairs of genital setae present.
6. Surface of femur of leg I with large foveolae.

***Hermannia fungifer* sp. n.**

M e a s u r e m e n t s : Length: 713-875 μm , width: 373-526 μm .

D o r s a l s i d e (Fig. 16): Rostral part of prodorsum nearly triangular. Rostral and lamellar setae equal in length, latter pair arising on tubercles, latter connected by a strong transversal lath. Interlamellar setae phylliform, similar to notogastral ones. Sensillus straight, not dilated, its distal end blunt. Between the bothridium a large, triangular area finely and densely punctate, framed laterally and basally by chitinous laths having laterally and medially stronger tubercles. On the anterior part of notogaster a characteristic mushroom-like structure, its frame consists of rugae and foveolae, inner surface punctate. Anterior margin of notogaster with a pair of tubercles laterally. Sixteen pairs of notogastral setae of different length and shape present, mostly dilated basally and thinned proximally (Fig. 18), however, some on the posterior margin stick-shaped, not thinned proximally. All setae finely roughened. Four pairs medially much shorter than laterally, fourth pair originating at the end of the "peduncle of the mushrooms", they arise very near to each other.

V e n t r a l s i d e (Fig. 17): Very similar to *H. quadrirotunda* (Hammer, 1979) from Java. Epimeral setal formula: 3-1-5-7. Genital opening framed by chitinous tubercles and rugae. Adanal setae short, very broad, only setae *ad*₁ thinned at the tip.

L e g s : Femur of leg I (Fig. 19) with 8 setae, of which 4 short; thick setae arising dorsally, in a longitudinal row.

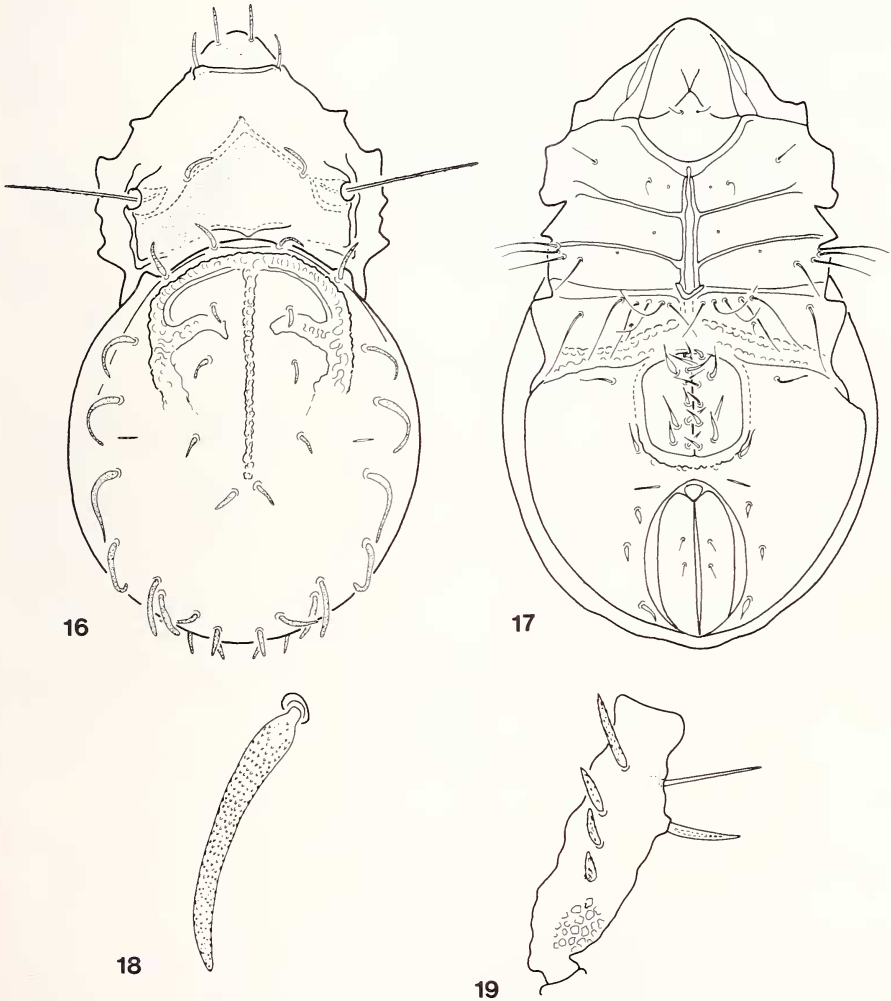
M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 23 paratypes: from the same sample, 7 paratypes: Pal-83/5. Holotype and 20 paratypes: MHNG, 10 paratypes (993-PO-84): HNHM.

R e m a r k s : The new species is well characterized by the sculpture of notogaster. On this ground it stands very near to *H. quadrirotunda* (Hammer, 1979), however, the

* BALOGH did not mention or show the sculpture of the ventral side, therefore, the following data and the drawings are given on the basis of the type series.

** Not eight, as given by BALOGH!

latter has much longer notogastral setae medially, the fourth pair of them standing far from each other, its posteromarginal setae are not stick-shaped and the femur of leg I has only three pairs of setae dorsally.



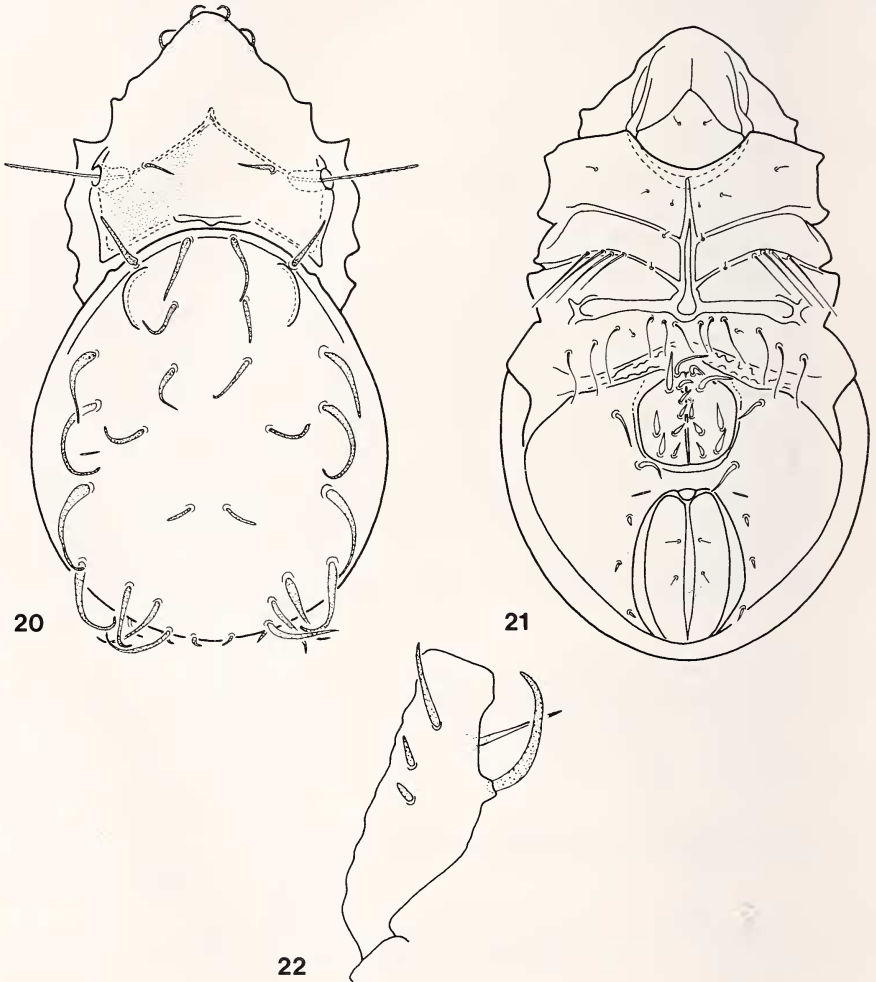
FIGS 16-19.

Hermannia fungifer sp. n. — 16: dorsal side, 17: ventral side, 18: notogastral seta, 19: femur of leg I from dorsal view.

***Hermannia heterotricha* sp. n.**

Measurements: Length: 632-769 μm , width: 324-470 μm . (Females larger than males.)

Dorsal side (Fig. 20): Rostrum wide, rounded. Rostral and lamellar setae nearly equal in length, curved inwards, both pairs arising on small chitinous thickenings. Interlamellar setae longer than the preceding pairs. Interbothridial region well punctate. Sensillus long, stick-shaped, not dilated, finely barbed. Prodorsum framed by a strong



FIGS 20-22.

Hermannia heterotricha sp. n. — 20: dorsal side, 21: ventral side, 22: femur of leg I from dorsal view.

chitinous lath. Anterior part of notogaster with a pair of semilunar chitinous structure. Sixteen pairs of notogastral setae, all dilated basally, but great differences among them. Three pairs in posteromarginal, the fifth pair in median position, much shorter and smaller than the others. Four pairs in lateromarginal position directed towards each other, composing a pair of characteristic group of setae. All setae finely roughened.

Ventral side (Fig. 21): Epimeral setal formula: 3-1-5-7. Four pairs of setae of epimere 3 erectile, straight and directed characteristically outwards. Six pairs of the setae of epimere 4 long, curved, one pair very short.

Legs: Femur of leg I (Fig. 22) with 7 setae, of which 3 short, thick setae arising dorsally, in a longitudinal row.

Material examined: Holotype: Pal-83/8, 16 paratypes: from the same sample. Holotype and 10 paratypes: MHNG, 6 paratypes (994-PO-84): HNHM.

Remarks: The new species belongs to the species-group which is characterized by the basally dilated notogastral setae, of which some compose a characteristic group of setae in lateromarginal position. The new species is distinguished from the related taxa [*H. kanoi* Aoki, 1959, *H. similis* (Balogh et Mahunka, 1967) and *H. javensis* (Hammer, 1979)] by the blunt, short and very closely originating fifth pair of notogastral setae in median position.

***Berlesezetes ornatisissimus* (Berlese, 1913)**

The species was described and figured by BERLESE from Java (BERLESE 1913: 89, fig. 58). Since then, in spite of the numerous related new species described from different tropical regions, this species was neither mentioned nor collected any more. The recently collected specimens (Figs 23-24) from Sabah are well corresponding to BERLESE's figure, and belong in my opinion to *ornatisissimus*. The difference from *B. auxiliaris* Grandjean, 1936 is very small, thus a revision is necessary.

I found the following differences:

1. Longitudinal ribs on the notogastral surface very long, reaching to setae r_1 .
2. Lamellar setae very thick, its surface roughened, curved inwards in front of the rostrum (as in *B. auxiliaris pachyseta* Hammer, 1971).

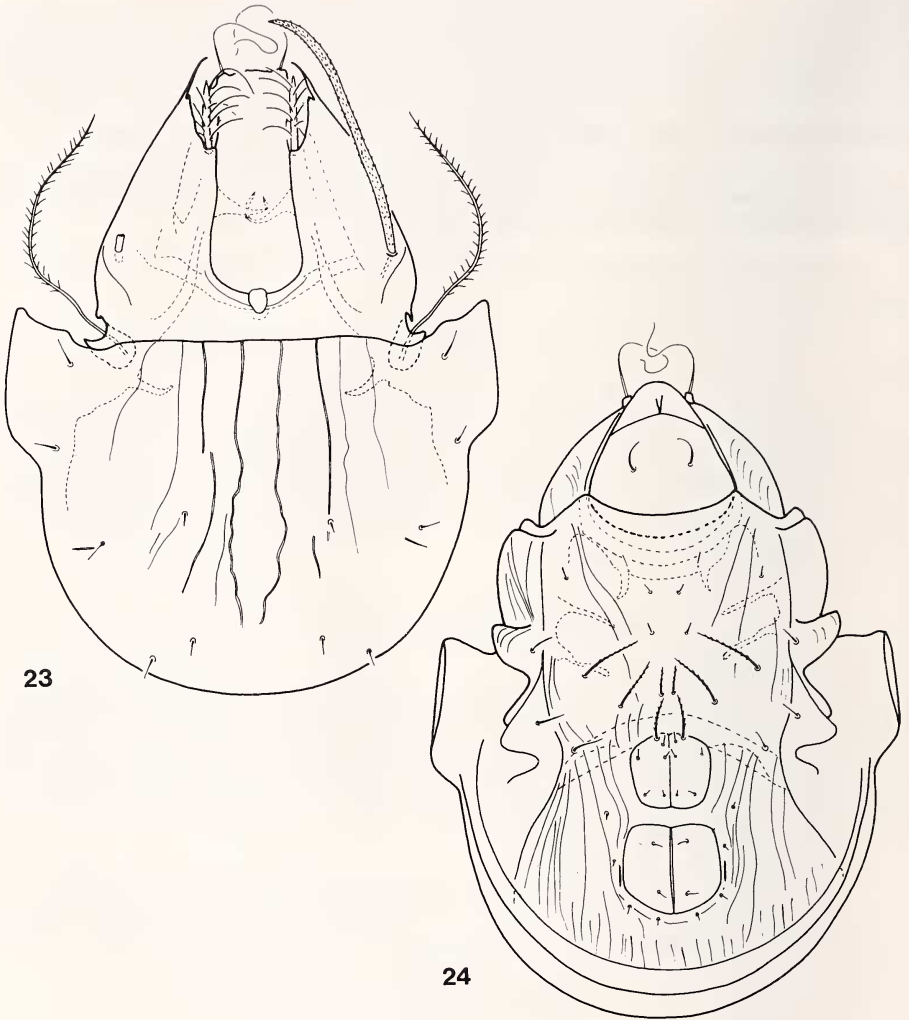
Measurements: Length: 174-190 μm , width: 140-149 μm .

Material examined: Pal-83/43: 6 specimens.

***Microzetes fimbriatus* sp. n.**

Measurements: Length: 240-247 μm , width: 194-199 μm .

Dorsal side (Fig. 25): Rostrum wide, rostral setae arising laterally on large tubercles. Under the lamellae a pair of large lamelliform appendages present, their distal part with numerous fringes (Fig. 27). Lamellae large, touching medially, with long, spiniform outer and rounded inner cusps. Lamellar setae strong, spiniform, interlamellar setae thin, arising on the dorsal surface of lamellae. Sensillus setiform, reclinate, distinctly spiculate. Notogaster very high anteriorly and steeply bending to its posterior end, its surface characteristically waved. Pteromorphae small, with some tubercles. All notogastral setae short and simple.

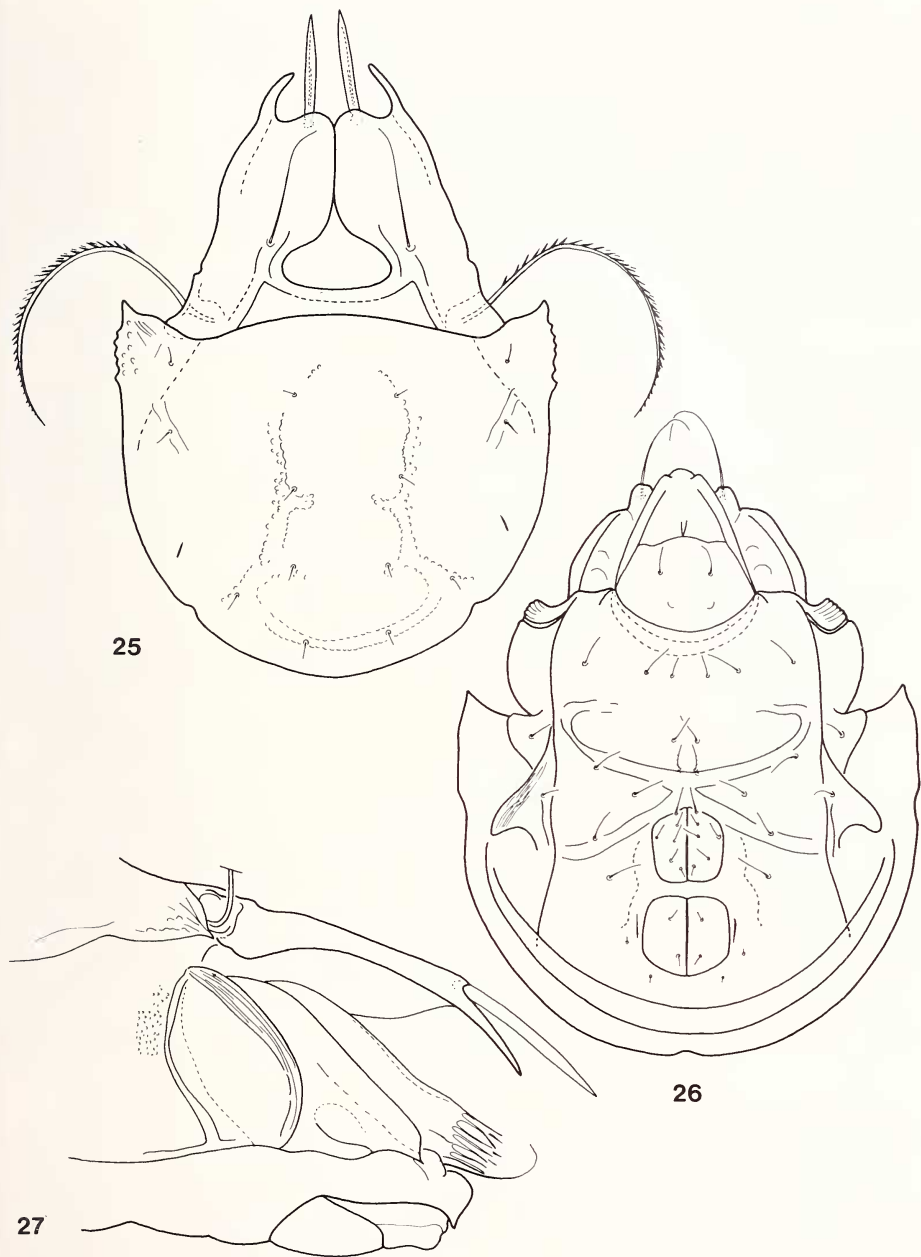


FIGS 23-24.

Berlesezetes ornatissimus (Berlese, 1913) — 23: dorsal side, 24: ventral side.

V e n t r a l s i d e (Fig. 26): Pedotecta I-II and IV with ribs, partly striated, epimeral surface smooth. Epimeral setae nearly equal in length, all simple, thin, finely barbed. Among the borders only the very thick sejugal and fourth ones observable. Six pairs of genital, one pair of aggenital, two pairs of anal and two (!) pairs of adanal setae present.

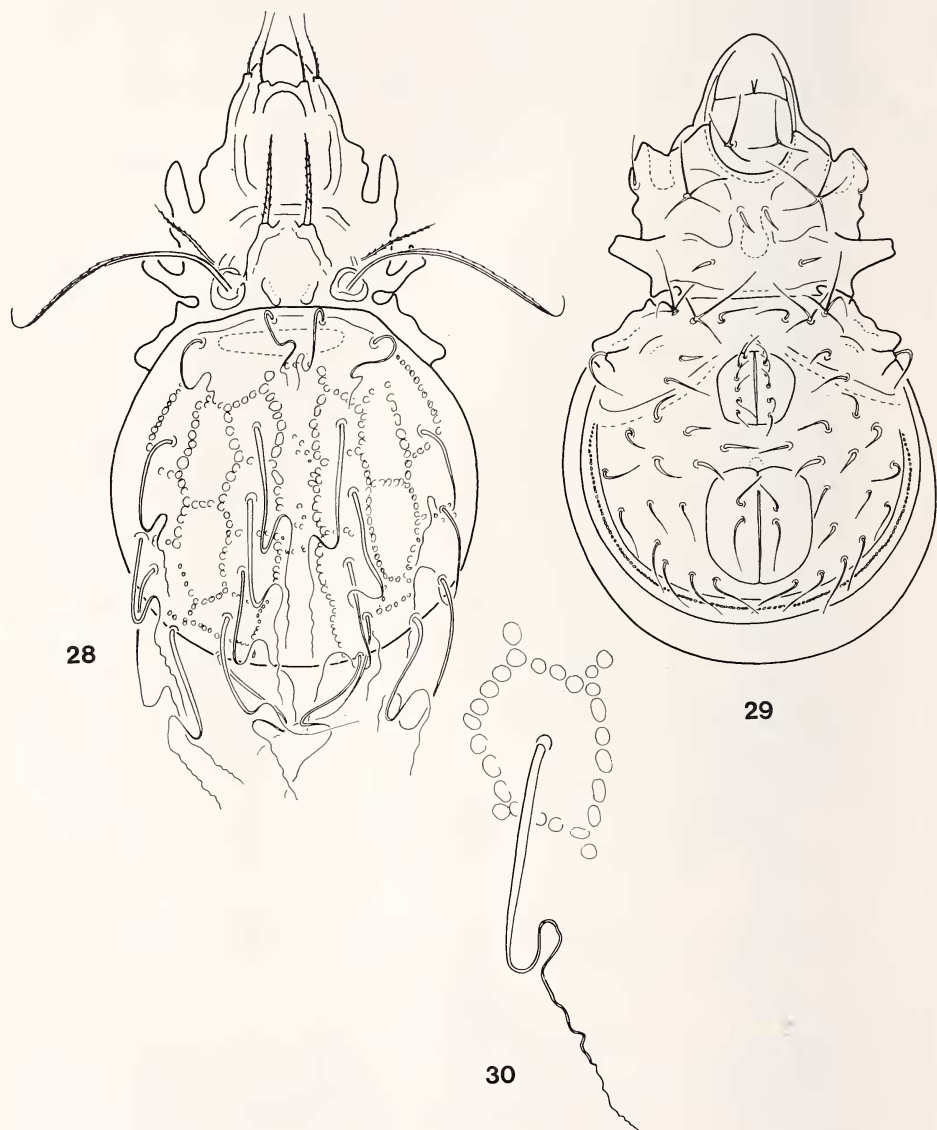
M a t e r i a l e x a m i n e d : Holotype: Pal-83/43, 4 paratypes: from the same sample. Holotype and 2 paratypes: MHNG, 2 paratypes (995-PO-84): HNHM.



FIGS 25-27.

Microzetes fimbriatus sp. n. — 25: dorsal side, 26: ventral side, 27: prodorsum from lateral view.

Remarks: The new species is well ordered to the genus *Microzetes* Berlese, 1913. It is well characterized by the tuberculate pteromorphae and the fringes of the lamelliform appendages. On this ground it is well distinguished from all related Microzetid taxa.



FIGS 28-30.

Eremobelba comteae sp. n. — 28: dorsal side, 29: ventral side, 30: notogastral seta.

Eremobelba comteae sp. n.

M e a s u r e m e n t s : Length: 353-374 μm , width: 202-227 μm .

Dorsal side (Fig. 28): Rostral setae slightly shorter than lamellar ones, interlamellar setae much longer and stronger than the preceding ones. Lamellar setae arising on a well-developed costula connected by a similar transversal lath. Interlamellar setae arising also on the cuspis on a pair of separated chitinous laths, both directed forwards. Exobothridial setae much longer than lamellar ones. Sensillus long, directed laterally, with finely serrated margin. Notogaster ornamented by granules arranged in a polygonal formation. Granules very large. Median field bordered by granules; closed anteriorly, but open posteriorly. Eleven pairs of notogastral setae, all flagellate (Fig. 30), some very long, but great differences among them.

V e n t r a l s i d e (Fig. 29): Typical for the genus. Setae *hy*, *lb*, *3b* and *3c* stellate, all others widened, sword-shaped. Six pairs of thin genital setae, all other setae in aggenital position slightly widened. On the ventral plate fourteen pairs of setae present, among them eight on the posterior part thinner and simple, all others dilated. Ventral plate framed posteriorly by a line of tubercles.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 16 paratypes: from the same sample. Holotype and 10 paratypes: MHNG, 6 paratypes (996-PO-84): HNHM.

R e m a r k s : The new species is related to *Eremobelba capitata* Berlese, 1913, however, its granules of the notogaster are much bigger than the latter, and the median field of the latter is open anteriorly and posteriorly.

The new species is dedicated to Mrs L. Comte, Dr. Hauser's assistant.

Berndobodes Mahunka, 1986 *

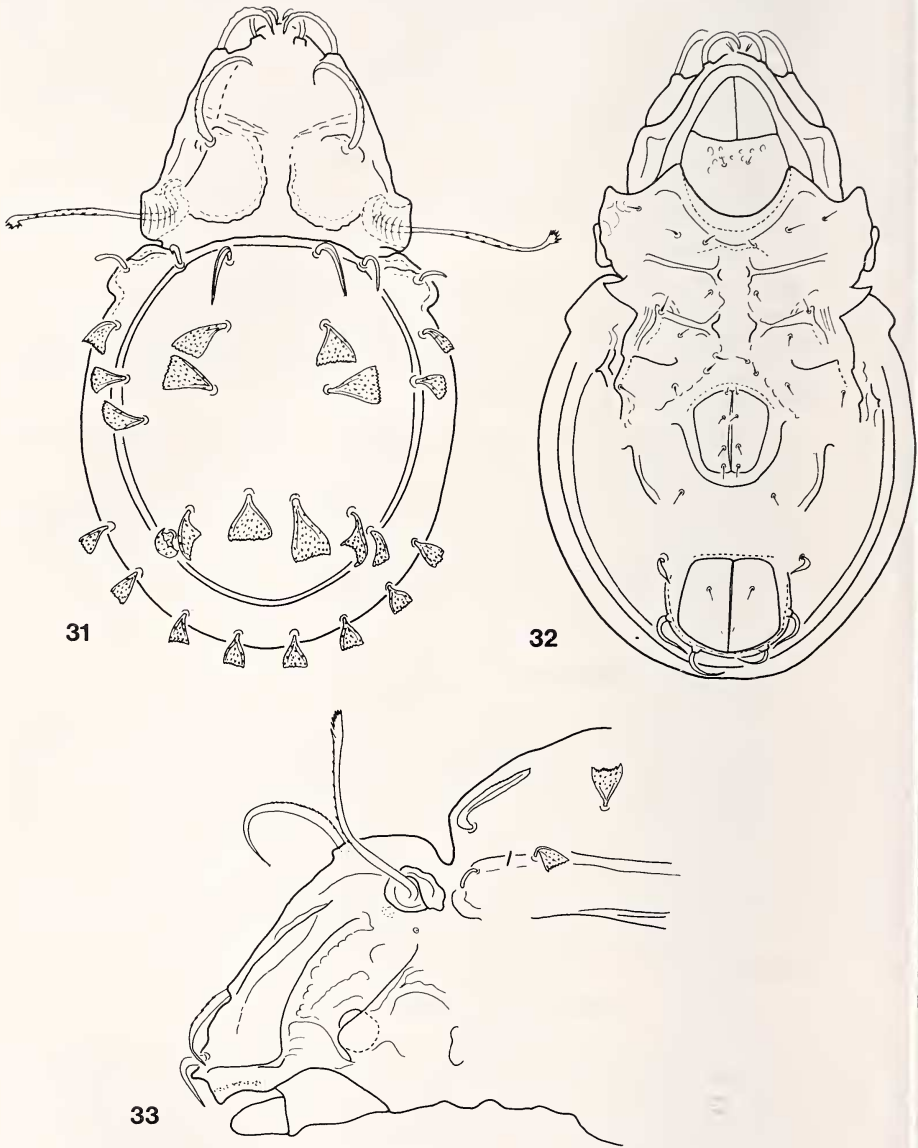
D i a g n o s i s : Family *Carabodidae*. Lamellae well developed, lamellar setae arising on their cuspis. Rostral setae arising on tubercles. Interlamellar setae originating between the lamellae, on separate chitinous ribs. Sensillus very long, with a small, separate head. Fifteen pairs of characteristic notogastral setae, four anterior pairs thinner, peach-leaf-shaped, all others dilated spathuliform but bent like a spoon. No deep hollow between prodorsum and notogaster, but owing to the dorsosejugal suture the anterior margin of notogaster very steep in lateral view. Inner part of notogaster well framed. Epimeral setal formula: 3-1-3-3. Four pairs of genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. Adanal setae phylliform, all others simple.

T y p e s p e c i e s : *Berndobodes spiculifer* Mahunka, 1986.

R e m a r k s : The new genus is well characterized by the very long sensillus, the origin of rostral, lamellar and interlamellar setae, the number and shape of the notogastral setae. In the family *Carabodidae* heretofore only two genera (*Archegocephus* Aoki, 1965 and *Yoshiobodes* Mahunka, 1986) were known which have 15 pairs of notogastral setae. The new genus is distinguished from both by the position of the notogastral setae, by the shape of sensillus and the shape of body.

I dedicate the new genus to my friend, Dr. B. Hauser, the collector of this very rich and interesting material.

* Only a preliminary description was given (MAHUNKA 1986).



FIGS 31-33.

Berndobodes spiculifer Mahunka, 1986 — 31: dorsal side, 32: ventral side, 33: prodorsum from lateral view.

Berndobodes spiculifer Mahunka, 1986

Measurements: Length: 312-376 μm , width: 176-238 μm .

Dorsal side (Fig. 31): Rostral, lamellar and interlamellar setae peach-leaf-shaped, marginally and dorsally spiculate (Fig. 33). Interlamellar setae slightly greater, their end bent backwards. Peduncle of sensillus gradually thinned outwards, thinnest just before the head. Its peduncle finely ciliate. Notogaster round, not typical *Carabodes*-like. Two pairs of notogastral setae arising on the shoulder and altogether eight pairs arising on the anterior half of notogaster. Seven pairs arising on the posterior end of body. Three pairs of setae thin, all originating anteriorly, or anterolaterally, all others spatulate, their surface spiculate.

Ventral side (Fig. 32): Apodemes and bordures weakly developed, sternal apodeme absent, epimeres open in the middle. Mentum with some round foveolae, other part of ventral plate smooth. All epimeral setae simple, short. Beside the genital plates a pair of semilunar chitinous laths present. Around the anal opening also a well-developed lath present bearing setae ad_1 and ad_2 . All adanal setae similar to prodorsal ones.

Material examined: Holotype: Pal-83/36, 5 paratypes: from the same sample. Holotype and 3 paratypes: MHNG, 2 paratypes (997-PO-84): HNHM.

Remarks: The new species is well distinguished from all related taxa by the shape and the spiculate surface of the notogastral setae and by the shape of sensillus.

Archegotocephus gen. n.

Diagnosis: Family *Otocephidae*. Lamellae long, lamelliform expansion (spa. *l.*) curved, reaching to the insertion points of rostral setae, tutorium short, not connected with spa. *l.* Pedotecta 2-3 symmetrical, fish-tail-like. Two pairs of prodorsal, one pair of (lateral) notogastral condyles present, the latter originating far from each other, so the notogaster not elongated anteriorly. Ten pairs of notogastral setae present. Epimeral setal formula: 3-1-3-3. Four pairs of genital, one pair of aggenital, three (!) pairs of anal and three pairs of adanal setae present. Pori *iad* in apoanal position, pori *ips* located between setae r_3 and ps_3 .

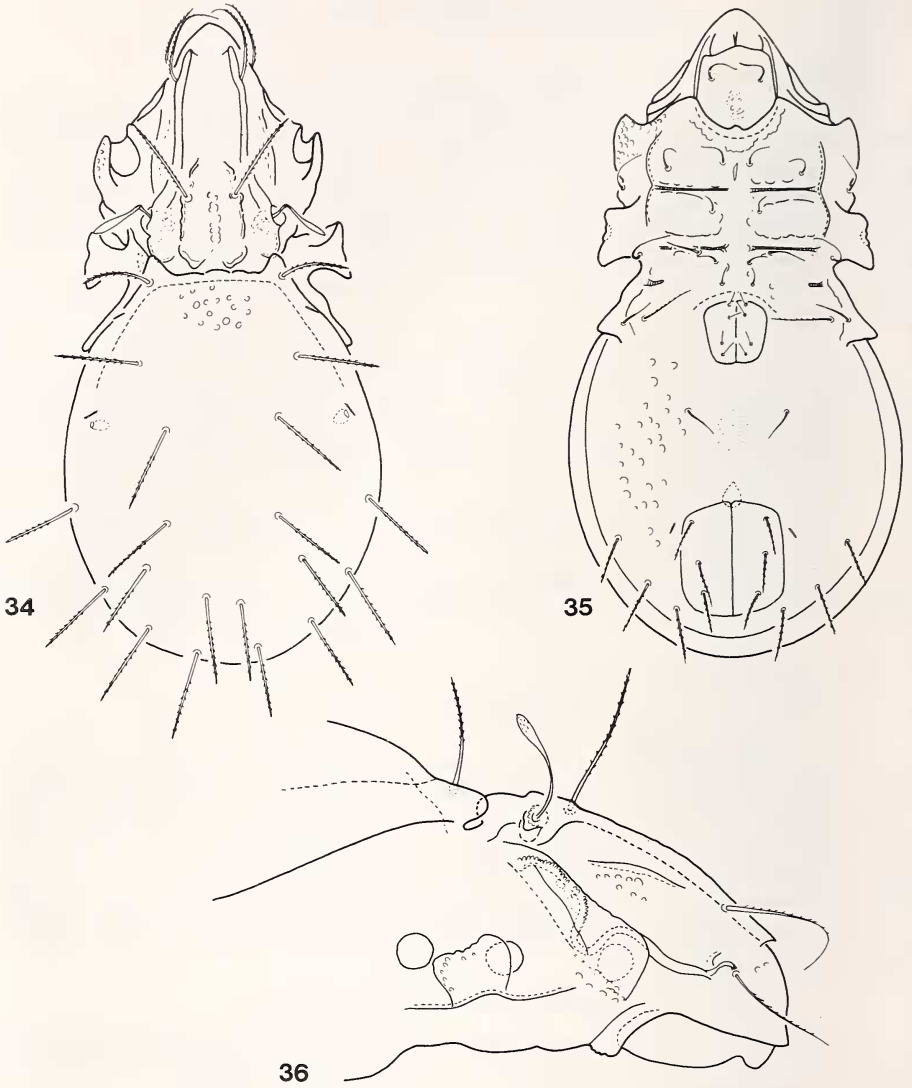
Type species: *Archegotocephus singularis* sp. n.

Remarks: The new taxon belongs to the subfamily *Otocephinae*, and stands comparatively near to genus *Otocephus*, however, it is distinguished by the unique number of anal setae and also some other very characteristic features.

Archegotocephus singularis sp. n.

Measurements: Length: 850-891 μm , width: 405-421 μm .

Dorsal side (Fig. 34): Rostral and lamellar setae very similar to each other, both pairs distinctly barbed. Interlamellar setae blunt at tip, much stronger and longer than the preceding ones. Beside their insertion points two thin chitinous laths run longitudinally. Prodorsal surface with some foveolae only on the anterior part. Sensillus short, with curved peduncle and clavate head. Median and lateral condyles of notogaster



FIGS 34-36.

Archegotocepheus singularis gen. n., sp. n. — 34: dorsal side, 35: ventral side, 36: prodorsum from lateral view.

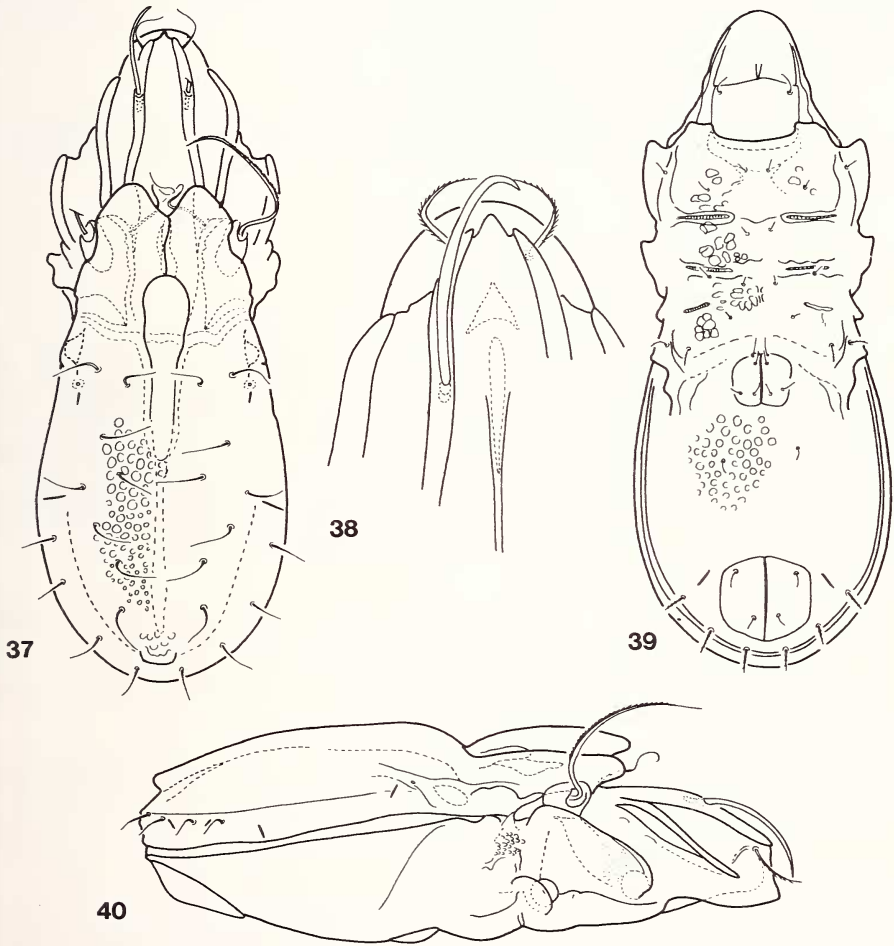
nearly equal in length. Notogastral surface foveolate. Ten pairs well ciliate notogastral setae present (blunt at tip), setae *ta* the shortest, setae *ps*₁ the longest of all. Surface of pedotecta 1 (Fig. 36) foveolate, pedotecta 2-3 with some granules.

Ventral side (Fig. 35): Median epimeral setae comparatively long, *1a* not shorter than *1b*, but *3a* much shorter than *3c*, *4b* longer than *4c*. Epimeral plate darker

than the other parts of ventral plate. Surface of ventral plate medially punctate, laterally ornamented by larger foveolae. All three pairs of anal setae nearly equal in length, pointed at tip. Among the blunt adanal setae ad_1 the longest, ad_3 the shortest.

Material examined: Holotype: Pal-83/8, 2 paratypes: from the same sample, 6 paratypes: Pal-83/5. Holotype and 5 paratypes: MHNG, 3 paratypes (998-PO-84): HHNM.

Remarks: The new species is quite singular within the family *Otocepheidae* as specified in the generic diagnosis.



FIGS 37-40.

Bulbocephus hauserorum gen. n., sp. n. — 37: dorsal side, 38: rostral part of prodorsum, 39: ventral side, 40: body from lateral view.

Bulbocephus gen. n.

D i a g n o s i s : Family *Otocephidae*. Lamellae and lateral lamelliform expansions very long, ending in similar cusps. Rostral setae thin, arising near to lamellar cusps. Lamellar setae originating on the dorsal surface of lamellae. Anterior part of notogaster (probably the lateral condyles) dilated, like a pair of wings covering the basal part of prodorsum. Between them a deep hollow present, from its end a long crista runs to the end of body. Notogastral surface with large foveolae, which form a polygonal reticulation. Apodemes and bordures weakly developed. Epimeral setal formula: 3-1-3-3. Four pairs of genital setae present, colour of the genital plates similar to that of ventral surface. One pair of aggenital, two pairs of anal and three pairs of adanal setae present. Setae ad_1 and ad_2 in postanal, ad_3 in preanal position. Pori *iad* curved, originating far from anal opening, in apoanal position.

T y p e s p e c i e s : *Bulbocephus hauserorum* sp. n.

R e m a r k s : In the family *Otocephidae* Balogh, 1961 a type like this was so far unknown. On the ground of the characters given in the description the new genus stands very far from its relatives.

Bulbocephus hauserorum sp. n.

M e a s u r e m e n t s : Length: 486-591 μm , width: 178-243 μm .

D o r s a l s i d e (Fig. 37): Rostral part of prodorsum (Fig. 38) covers well the mouthparts. Dorsal margin of pedotecta I sharp, not divided. Interlamellar setae flagellate, originating under the "wings" of notogaster. Bothridium resembling a cup rising from the surface of prodorsum. Lateral part of prodorsum (Fig. 40), behind pedotecta I, with a field of large granules. Twelve pairs of notogastral setae present.

V e n t r a l s i d e (Fig. 39): Epimeral surface ornamented with irregular spots, ventral plate with regular foveolae, like those on notogastral surface.

L e g s : All legs monodactylous.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/13, 5 paratypes: from the same sample. Holotype and 3 paratypes: MHNG, 2 paratypes (999-PO-84): HNHM.

R e m a r k s : The new species may be easily distinguished from all other *Otocephid* taxa.

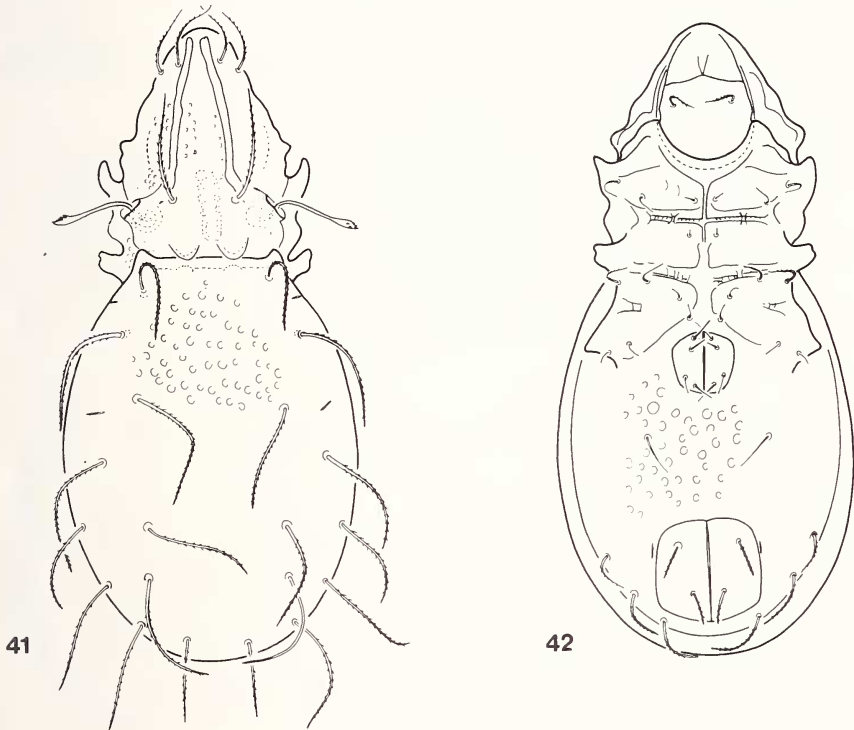
I dedicate the new species to Dr. Hauser's family.

Dolicheremaeus sabahnus sp. n.

M e a s u r e m e n t s : Length: 445-518 μm , width: 251-292 μm .

D o r s a l s i d e (Fig. 41): Rostrum rounded, lamellae very long, narrow, their cusps ending not far from rostrum. Lamellar setae originating not immediately near to lamellae. Rostral setae arising laterally, both pairs thin and pointed at tip, lamellar setae slightly longer than the others. Interlamellar setae very long and thick, blunt at tip. Sensillus directed laterally, its head small, with some spicules. Median prodorsal condyles large, semilunar, well framed. Lateral condyles small, hardly observable. Anterior border

of notogaster straight, median condyles reduced, only a hardly visible chitinous lath present. Lateral notogastral condyles also small, but separated. Notogastral surface ornamented by large foveolae. All notogastral setae long, strong, blunt at tip, well ciliate. Posteromarginal setae presenting differences in their lengths, ps_1 and r_3 shorter than ps_2 and ps_3 .



FIGS 41-42.

Dolicheremaeus sabahnus sp. n. — 41: dorsal side, 42: ventral side.

Ventral side (Fig. 42): Epimeral surface without foveolae, only finely punctate. Epimeral setal formula: 3-1-3-3. All epimeral setae short, setae *1c*, *3b* and *3c* slightly longer than the others. Four pairs of simple genital setae, one pair of long apiculate aggenital, two pairs of blunt anal, and three pairs of adanal setae present. The latter five pairs blunt at tip, all ciliate.

Material examined: Holotype: Pal-83/8, 5 paratypes: from the same sample, 16 paratypes: Pal-83/13. Holotype and 13 paratypes: MHNG, 10 paratypes (1000-PO-84): HNHM.

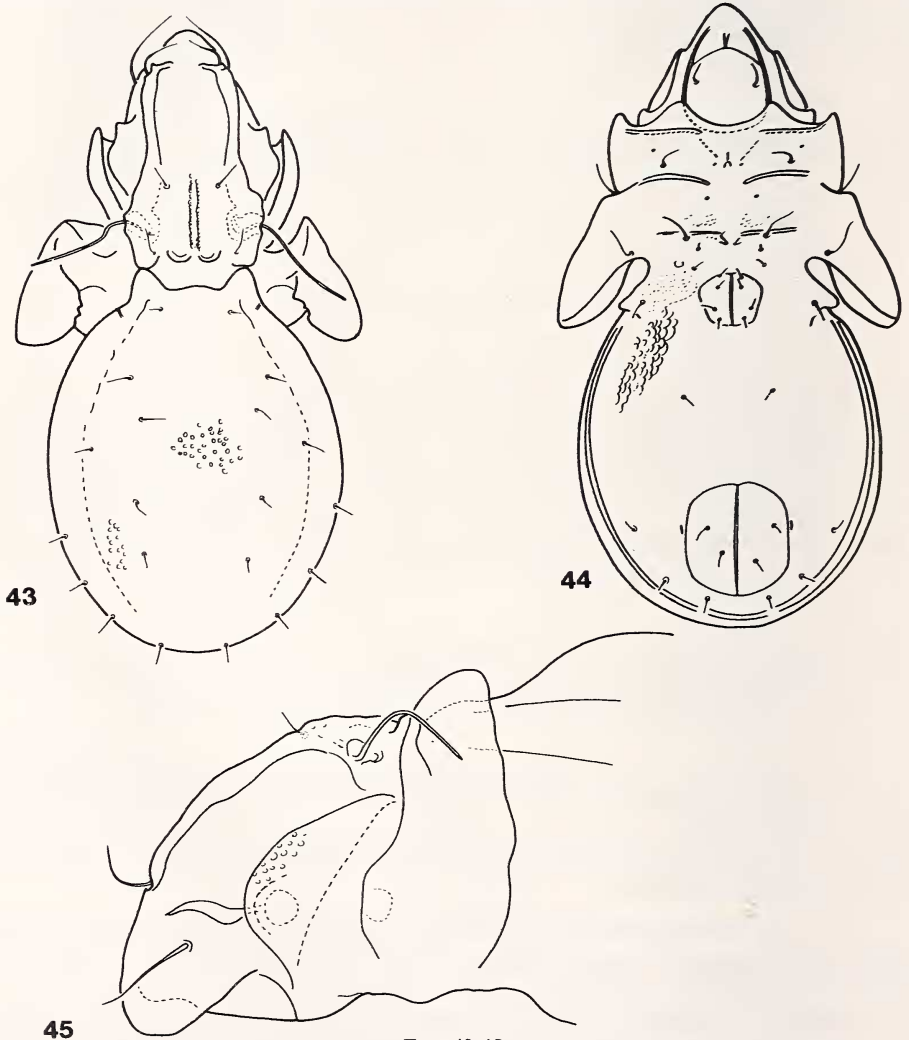
Remarks: On the ground of the reduced median condyles of the notogaster the new species stands nearest to *Dolicheremaeus variolobatus* Hammer, 1981 however, the head of the sensillus of the latter is not separated and the lateromarginal setae are equal in length.

Ikarotocepheus gen. n.

Diagnosis: Family *Otocepheidae*. Similar to the genus *Eurostocepheus*. Lamellae well developed with dilated end. Prodorsal condyles separated from each other. No median notogastral condyles present, anterior part of notogaster wide. Pedotecta II-III characteristically modified, very large, wing-shaped, bent upwards.

Type species: *Ikarotocepheus alatus* sp. n.

Remarks: The new taxon stands near to *Eurostocepheus* Aoki, 1965, however the modified pedotecta II-III necessitate the establishment of a new genus.



FIGS 43-45.

Ikarotocepheus alatus gen. n., sp. n. — 43: dorsal side, 44: ventral side, 45: prodorsum from lateral view.

***Ikarotocepheus alatus* sp. n.**

Measurements: Length: 729-891 μm , width: 300-413 μm .

Dorsal side (Fig. 43): Rostrum rounded, lamellae ending far from its apex. Lateral lamelliform expansion short, sigmoid (Fig. 45), similar to the type of the genus *Eurostocepheus*. Interlamellar setae shorter than lamellar ones. Sensillus setiform. Prodorsal condyles well developed, outer pair larger than inner one. Ten pairs of short, simple notogastral setae present, notogastral surface with small, but well-separated and well visible tubercles. Pedotecta II-III very large, posterior part bending back, over notogaster.

Ventral side (Fig. 44): Anterior margin of epimeral region with a pair of well-developed chitinous lath. Surface of epimeral region finely punctate. Ventral plate with polygonal sculpture. Genital plates much darker than any other part of body, with four genital setae. Anal and adanal setae simple, short.

Material examined: Holotype: Pal-83/13, 5 paratypes: from the same sample. Holotype and 3 paratypes: MHNG, 2 paratypes (1001-PO-84): HNHM.

Remarks: The new species is well characterized by the form of pedotecta II-III. On this ground it may be immediately distinguished from all Otocepheid taxa.

***Leptotocepheus orientalis* sp. n.**

Measurements: Length: 575-859 μm , width: 235-381 μm .

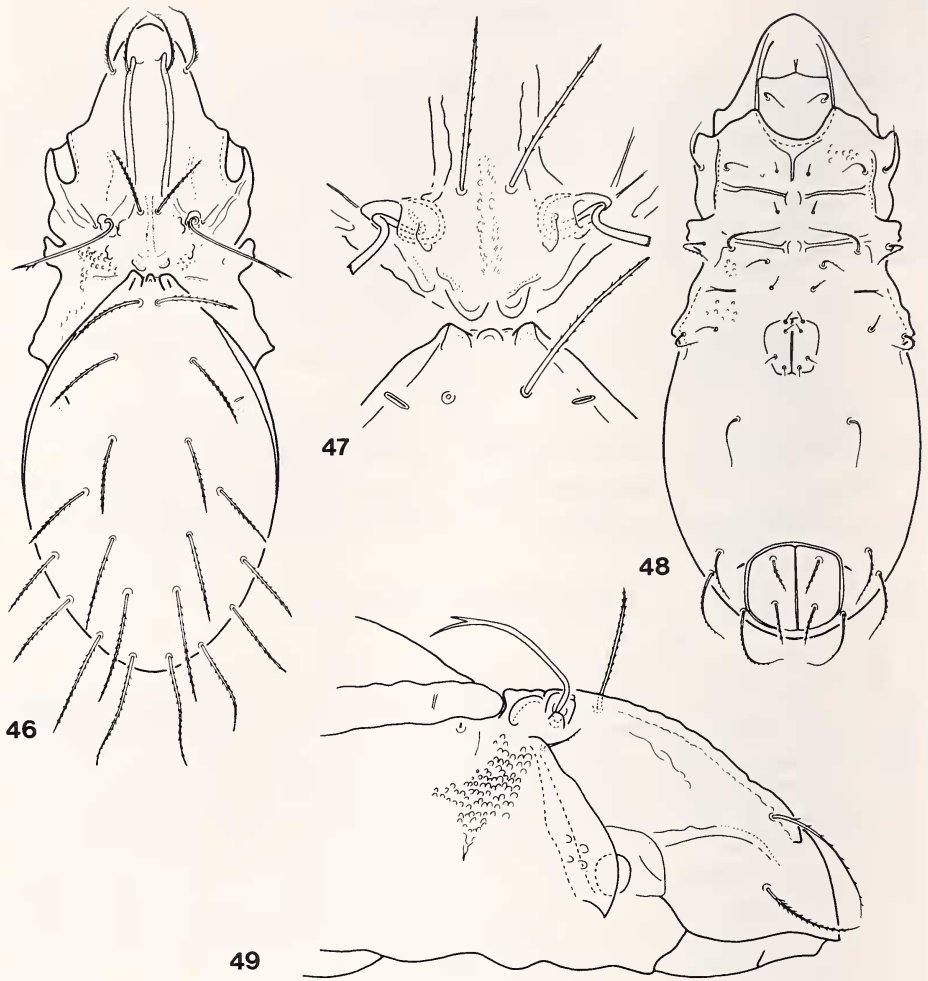
Dorsal side (Fig. 46): Rostrum rounded. Rostral setae distinctly barbed, originating laterally. Lamellar setae arising very near to narrow lamellae, only thinly ciliate. Both pairs pointed at tip. Interlamellar setae originating very near to each other, blunt at tip. Sensillus turning basally, thin and long, not thicker on its distal end, but bi-, or sometimes trifurcate, displaying great differences among the branches (Fig. 49). Condyles of prodorsum very weakly developed, thin; lateral and median one not connected with each other. Lateral part of prodorsum granulated, pedotecta I-II and IV foveolate. Notogaster strongly narrowed anteriorly, two lateral condyles and one unpaired median one (Fig. 47), located very near to each other, all three small. Ten pairs of notogastral setae present, gradually becoming longer towards the end, setae *ta* the shortest and setae p_1 the longest.

Ventral side (Fig. 48): Epimeral surface with some foveolae. Epimeral setal formula: 3-1-3-3, a large difference present among the lengths of epimeral setae, *1c*, *3b*, *3c* and *4c* much longer than the others, setae *3b* the longest. Four pairs of short genital setae, one pair of comparatively long and thin aggenital, three pairs of thicker adanal and two pairs of anal setae present. Pori *iad* in apoanal position.

Legs: Type of the ultimate setae L-S-S-S.

Material examined: Holotype: Pal-83/8, 8 paratypes: from the same sample. Holotype and 5 paratypes: MHNG, 3 paratypes (1002-PO-84): HNHM.

Remarks: The genus *Leptotocepheus* Balogh, 1961 was based on the type species from East Africa (*L. trimucronatus*) which is characterized by the three notogastral condyles and the nine pairs of notogastral setae. The new species may be ranged in this genus, however, it has ten pairs of notogastral setae and a very characteristic sensillus. On this ground it is well distinguishable from all related taxa.



FIGS 46-49.

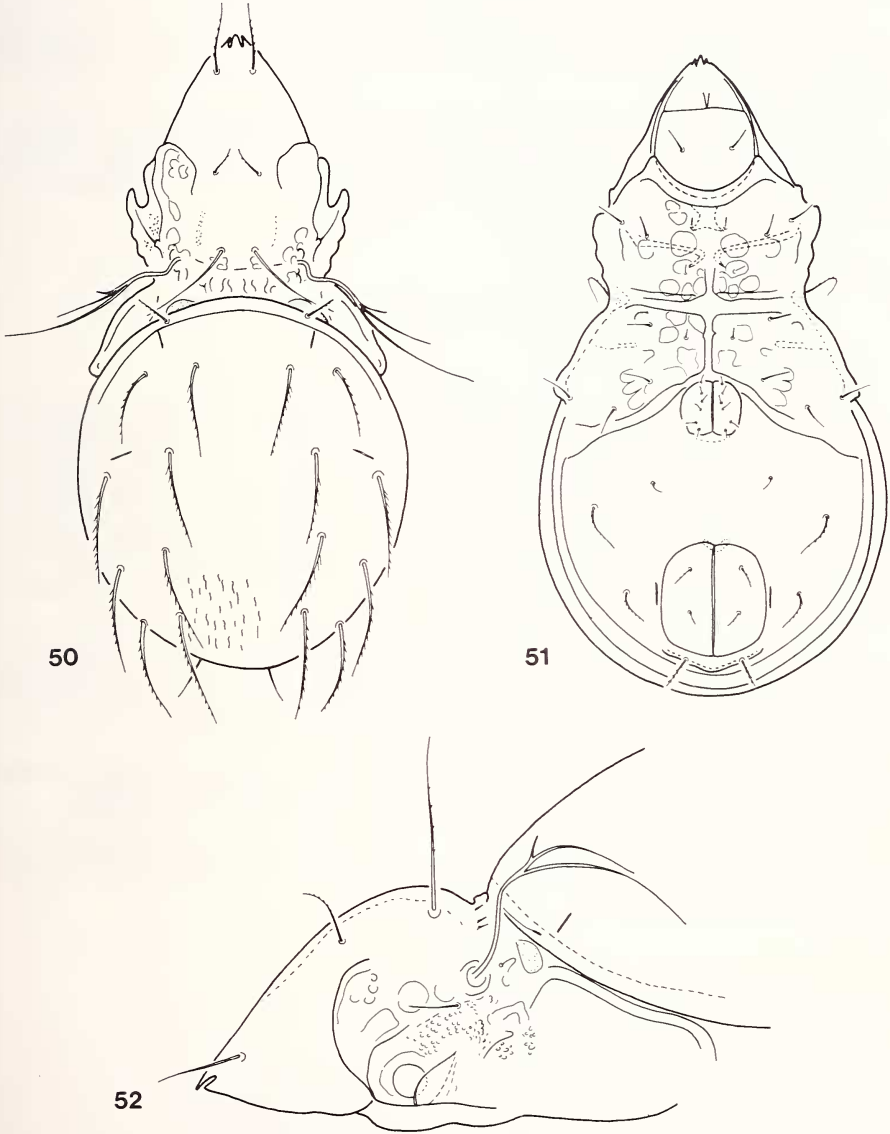
Leptotocepheus orientalis sp. n. — 46: dorsal side, 47: tubercles of prodorsum and notogaster, 48: ventral side, 49: prodorsum from lateral side.

***Arcoppia robusta* sp. n.**

Measurements: Length: 386-436 μm , width: 188-208 μm .

Dorsal side (Fig. 50): Rostrum typically tripartite, its median apex slightly longer than the lateral ones. Rostral setae longer than the lamellar, but much shorter than the interlamellar ones (Fig. 52). Costula and their transversal band completely reduced,

only some granules visible in this place. Sensillus without dilated head, very long, with three branches, first one being the longest, third one minute. Lateral part of prodorsum well granulate (Fig. 52). Notogaster with 10 pairs of strong and well-ciliate setae. Surface of its posterior part ornamented with fine scratches.



FIGS 50-52.

Arcoppia robusta sp. n. — 50: dorsal side, 51: ventral side, 52: prodorsum from lateral view.

Ventral side (Fig. 51): Sejugal and fourth apodemes and borders strong, all other ones thin, hardly visible. Epimeral surface with large, round spots, no polygonal reticulation observable. All epimeral setae simple. Six pairs of short genital setae present, they arise along a longitudinal row. Aggenital setae short and simple, anal and adanal ones well-ciliate, similar to notogastral setae.

Material examined: Holotype: Pal-83/8, 2 paratypes: from the same sample, 2 paratypes: Pal-83(5). Holotype and 2 paratypes: MHNG, 2 paratypes (1003-PO-84): HNHM.

Remarks: Resembling the recently described *Arcoppia* Hammer, 1977 species, the new species is well distinguished from all the others by the simple, not dilated sensillus. The absence of the costula, the scratched notogaster and the strong notogastral setae also well characterize this species.

***Arcoppia sabahensis* sp. n.**

Measurements: Length: 337-361 μm , width: 183-198 μm .

Dorsal side (Fig. 53): Rostrum tripartite, median cuspis much longer than lateral ones (Fig. 56). Costula strongly framed only anteriorly and medially the basal part represented only by granules, ordered into longitudinal lines. Lateral chitinous laths also very strong. Lamellar setae shorter than interlamellar or rostral ones, *ro* \cong *in*. Two pairs of light spots present in the interbothridial, two pairs of chitinous thickenings in the dorso-sejugal region. Lateromarginal part of prodorsum (Fig. 55) well granulate. Sensillus not dilated, but divided into three long branches. Ten pairs of thin notogastral setae present, all finely ciliate, setae *ta* much shorter than the others.

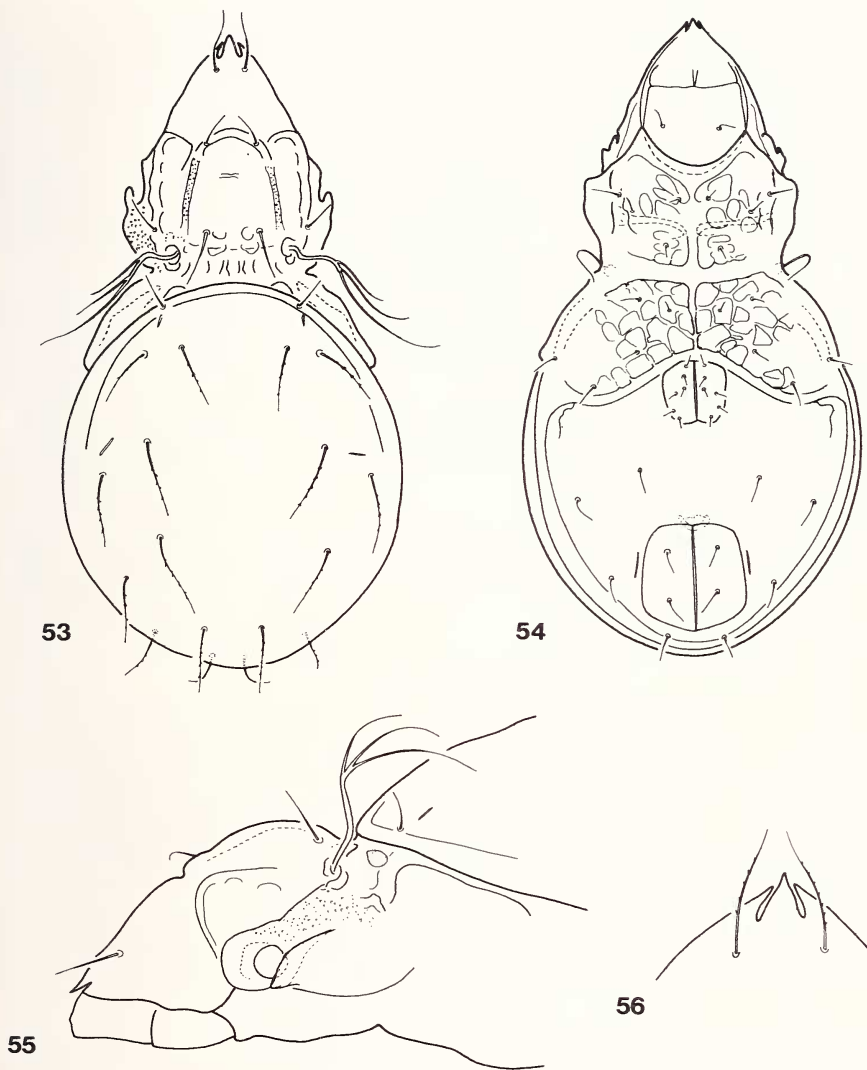
Ventral side (Fig. 54): Sejugal apodemes 4 and borders thick, all others thin, hardly visible. Surface of epimeres ornamented with polygonate sculpture. All epimeral setae simple, *3c* longer than the others. Six pairs of genital setae present. All setae in anogenital region similar to those of the other species of this genus.

Material examined: Holotype: Pal-83/8, 14 paratypes: from the same sample. Holotype and 8 paratypes: MHNG, 6 paratypes (1004-PO-84): HNHM.

Remarks: The new species is well ranked to the genus *Arcoppia* Hammer, 1977. It is distinguished from all heretofore known taxa by its thin, only divided and not dilated sensillus having three branches.

***Foveolatoppia* gen. n.**

Diagnosis: Family *Oppiidae*. Rostrum rounded, without incision. Rostral setae arising laterally near to rostrum. A weak costula present, lamellar setae arising nearer to interlamellar than to rostral ones. Interlamellar area ornamented with some rugae. Sensillus pectinate, with 5-6 long branches. Interlamellar setae long. Exobothridial region tuberculate. Notogaster with ten pairs of setae, but setae *ta* minute. Surface of notogaster ornamented by foveolae and some rugae on the anterior margin. Epimeral setal formula: 3-1-3-3. Apodemes 4 composing a transversal band behind the genital plates.



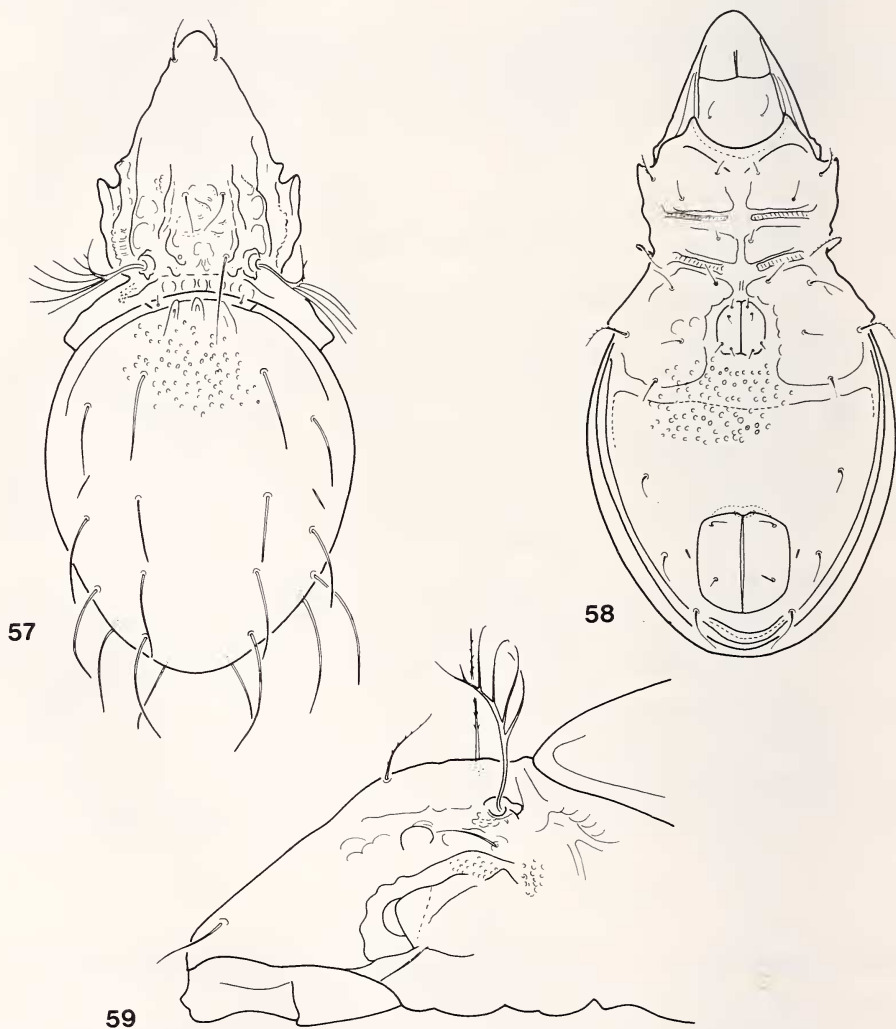
FIGS 53-56.

Arcoppia sabahensis sp. n. — 53: dorsal side, 54: ventral side, 55: prodorsum from lateral view, 56: rostrum.

Four pairs of genital setae present. Setae ad_1 in postanal, ad_2 in paraanal, ad_3 in preanal position. Pori iad in apoanal position. All legs normal, without any characteristic distinguishing marks.

Type species: *Foveolatoppia foveolata* sp. n.

R e m a r k s : The new species is related to the genus *Pulchroppia* Hammer, 1979, however, it has well developed fourth apodemes and four pairs of genital setae. Owing to these characters it stands very far from all other heretofore known Oppiid genera.



FIGS 57-59.

Foveolatoppia foveolata gen. n., sp. n. — 57: dorsal side, 58: ventral side, 59: prodorsum from lateral view.

Foveolatoppia foveolata sp. n.

Measurements: Length: 688-713 μm , width: 324-356 μm .

Dorsal side (Fig. 57): Rostral and lamellar setae well-ciliate. Lateral part of prodorsum well chitinized, ornamented with tubercles and ribs, exobothridial setae comparatively long (Fig. 59). Basal part of prodorsum carrying some ribs, directed longitudinally. Setae *ta* minute, all other notogastral setae strong, not pointed at tip, smooth, gradually becoming longer towards the end.

Ventral side (Fig. 58): Epimeral setae different in lengths, median ones much longer than the others in lateral position. Setae *1c*, *3c* and *4c* much longer and more ciliate than the median ones. Epimeral surface with irregular spots, surface behind the genital opening foveolate. Adanal setae different in lengths, *ad*₁ the longest, *ad*₃ the shortest.

Material examined: Holotype: Pal-83/8, 1 paratype: from the same sample, 1 paratype: Pal-83/5. Holotype and 1 paratype: MHNG, 1 paratype (1005-PO-84): HHNM.

Remarks: The new species is well distinguished from all other Oppiid species by some characters, e.g. the structure of prodorsum, the sculpture of notogaster and the ventral plate and the characteristic shape of apodemes 4 around the genital opening.

Papillonotus hauseri sp. n.

Measurements: Length: 277-287 μm , width: 148-158 μm .

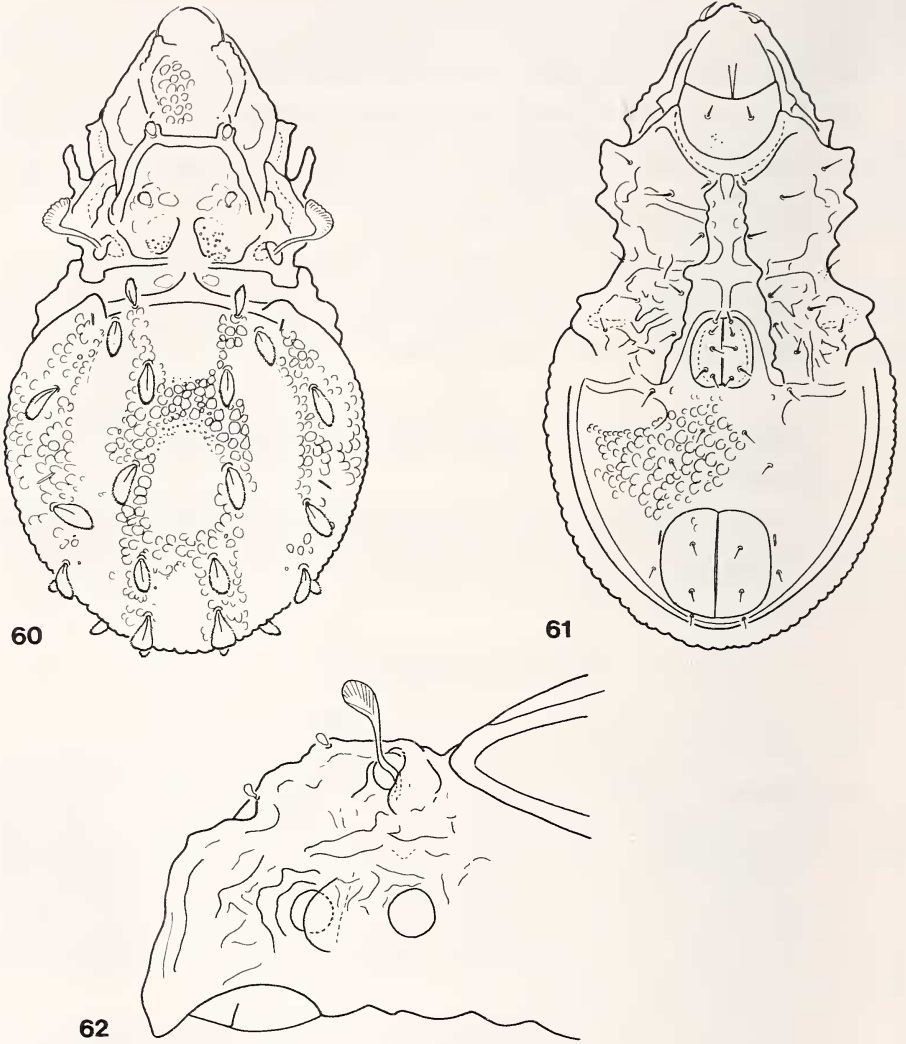
Dorsal side (Fig. 60): Rostrum conical, rostral setae simple, arising laterally on small tubercles. Prodorsal surface with numerous strong chitinous laths (Fig. 62), costula and a transcostula well distinguishable, costula continued in a precostula. Lamellar and interlamellar setae phylliform, lamellar setae originating on the surface of costulae. Two pairs of large spots and some rugae in the interlamellar area, prodorsal surface covered by large secretion granules of different sizes. Sensillus short, directed laterally and anteriorly. Notogastral surface covered also by secretion granules, they compose a characteristic formation. Eleven (!) pairs of phylliform notogastral setae present, their margin finely ciliate.

Ventral side (Fig. 61): Epimeral region strongly chitinized, apodemes and bordures well developed. A hollow in median line present. Epimeral setal formula: 3-1-3-4, all setae strong. Epimeral surface ornamented with rugae, anogenital region with secretion tubercles. Adanal setae short, *ad*₃ in preanal position.

Material examined: Holotype: Pal-83/8, 4 paratypes: from the same sample. Holotype and 2 paratypes: MHNG, 2 paratypes (1006-PO-84): HHNM.

Remarks: The new species is well ranged to the genus *Papillonotus* Wallwork, 1961, heretofore only known by the type species (*P. maculatus* Wallwork, 1961). The new species is distinguished from it by the shorter costulae, the position of lamellar setae, the secretion granules of the notogaster and anogenital region and by the shape of the epimeral region.

I dedicate the new species to my friend Dr. B. Hauser, the collector of this and other very rich Oribatid material.



FIGS 60-62.

Papillonotus hauseri sp. n. — 60: dorsal side, 61: ventral side, 62: prodorsum from lateral view.

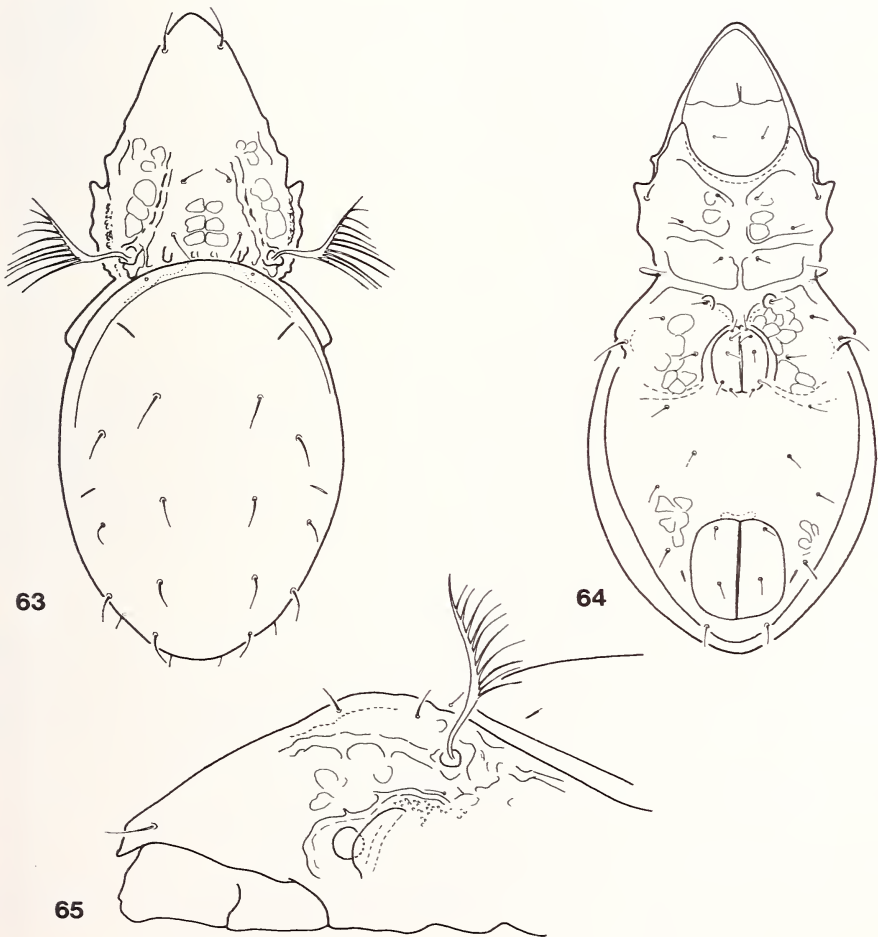
***Pulchroppia elegans* sp. n.**

Measurements: Length: 274-297 μm , width: 119-134 μm .

Dorsal side (Fig. 63): Rostral setae longer than lamellar and interlamellar ones. Basal part of prodorsum well chitinized, costulae developed, well visible. Laterally

also some rugae present and a smaller part (Fig. 65) granulate. Three pairs of lighter spots and two tubercles present in the interbothridial region. Sensillus pectinate, with 8-10 long branches. Nine pairs of notogastral setae present, setae *ta* represented only by their alveoli. All setae short and simple.

Ventral side (Fig. 64): Generally similar to the type of the genus, however, a weak apodeme observable by the posterior end of genital opening. Epimeral surface with spots, this sculpture is visible also on the ventral plate. Five pairs of genital setae present, the position of aggenital and adanal setae, just as that of pori *iad* similar to those of other species of the genus.

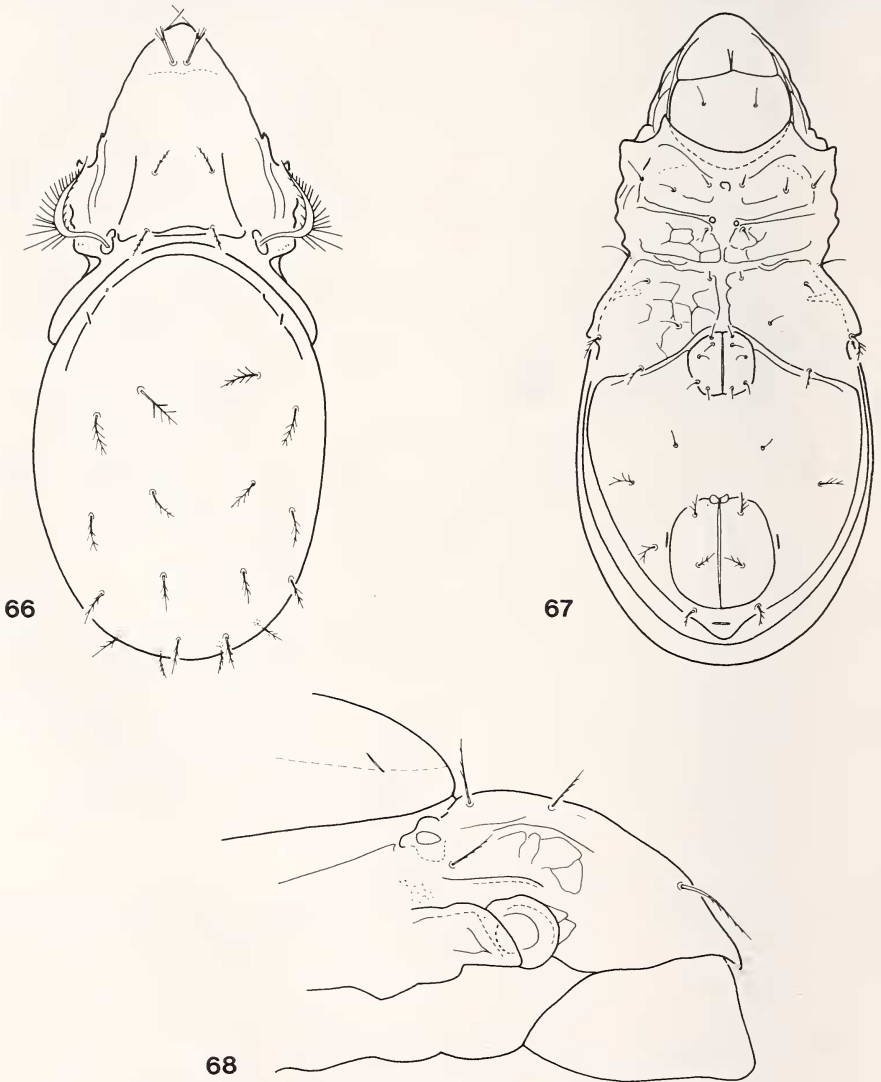


FIGS 63-65.

Pulchroppia elegans sp. n. — 63: dorsal side, 64: ventral side, 65: prodorsum from lateral view.

Material examined: Holotype: Pal-83/8, 2 paratypes: from the same sample, 1 paratype: Pal-83/13. Holotype and 2 paratypes: MHNG, 1 paratype (1007-PO-84): HNHM.

Remarks: The heretofore known species of the genus *Pulchroppia* Hammer, 1979 was well characterized by the lack of the costula. The new species has a pair of well-developed chitinous laths in this position. It is distinguished from the other species also by the three pairs of spots and two pairs of tubercles in interbothridial position.



FIGS 66-68.

Ramusella pinifera sp. n. — 66: dorsal side, 67: ventral side, 68: prodorsum from lateral view.

Ramusella pinifera sp. n.

Measurements: Length: 181-185 μm , width: 53-55 μm .

Dorsal side (Fig. 66): Rostrum rounded, rostral setae geniculate, arising on dorsal surface of prodorsum, very near to each other. Costula absent, but a sharp line visible in this region. Lamellar, interlamellar and exobothridial setae short, nearly equal in length (Fig. 68), all three pairs with long cilia. Sensillus large, with numerous, long branches, some but fewer branches exist on the inner side of its head, too. In the interbothridial region a transversal chitinous lath present. Nine pairs of characteristic notogastral setae present, all piniform, with very long and strong lateral cilia. Setae *ta* represented only by their alveoli.

Ventral side (Fig. 67): Apodemes and bordures weakly developed. Epimeral setae short, some of them ciliate, setae *4c* well ciliate, similar to notogastral, anal and adanal ones. Five pairs of genital and one pair of aggenital setae, simple.

Material examined: Holotype: Pal-83/43, 1 paratype: from the same sample. Holotype: MHNG, paratype (1008-PO-84): HNHM.

Remarks: On the ground of the characteristic notogastral setae, the new species may be well distinguished from all heretofore known *Ramusella* Hammer, 1962 species.

Striatoppia modesta sp. n.

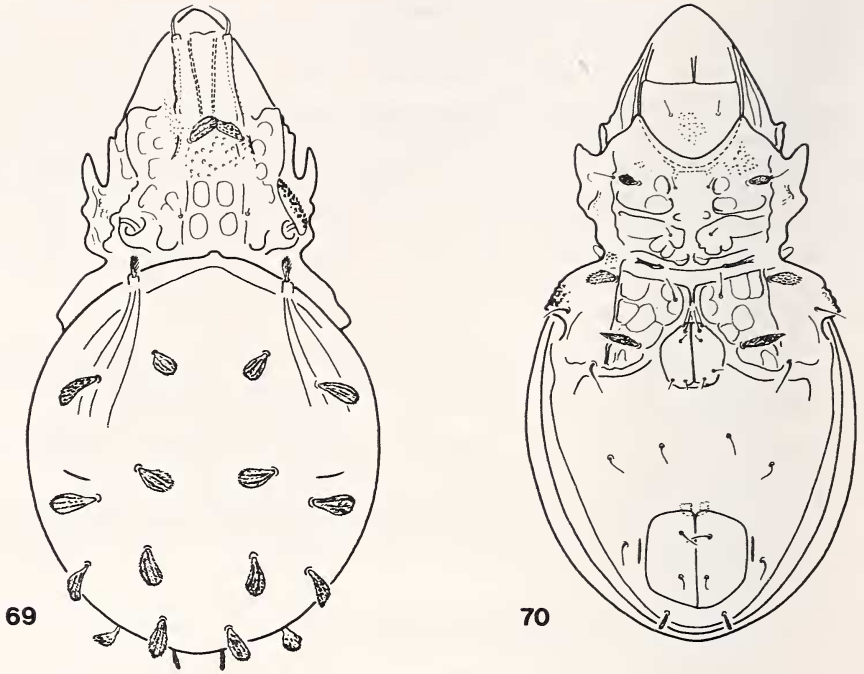
Measurements: Length: 198-221 μm , width: 111-116 μm .

Dorsal side (Fig. 69): Prodorsal sculpture similar to the other species, two pairs of chitinous ridges on the anterior part of prodorsum, medially covered by larger, anteriorly by smaller secretion granules. Lamellar setae clavate, spiculate, originating in the middle of prodorsum. In the interbothridial region two pairs of light spots, interlamellar setae arising on two ridges framing the two pairs of spots. Lateral longitudinal ridges of prodorsum stronger than median ones. Exobothridial surface also granulate. Notogaster only with two or three pairs of longitudinal lines. Ten pairs of notogastral setae present, they are typical for the genus, dilated and spiculate.

Ventral side (Fig. 70): Mentum and anterior part of epimeral surface with secretion granules (constant). Epimeral setae belong to different types, *1b*, *3b* and *4a* broad, lanceolate and ciliate, all others thin and simple. Setae *1b* and *3b* rounded, *4a* elongated. Epimeral surface ornamented by scattered large spots. Ventral surface without any sculpture (!). Aggenital, the first and second pairs of adanal setae (*ad*₂ and *ad*₃) simple, setae *ad*₁ slightly ciliate.

Material examined: Holotype: Pal-83/8, 4 paratypes: from the same sample. Holotype and 2 paratypes: MHNG, 2 paratypes (1009-PO-84): HNHM.

Remarks: The new species belongs to the "*opuntiseta*"-group. It is distinguished from the other heretofore known taxa by the unornamented ventral plate and the few longitudinal lines on the notogaster.



FIGS 69-70.

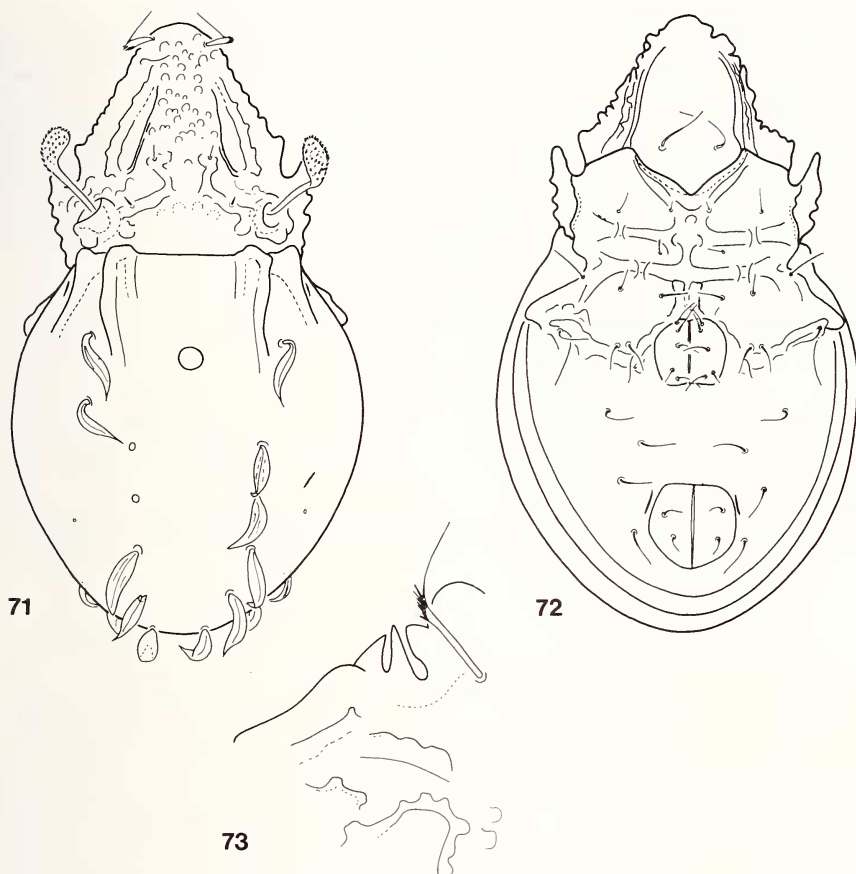
Striatoppia modesta sp. n. — 69: dorsal side, 70: ventral side.

Suctobelbella foliosa sp. n.

Measurements: Length: 193-195 μm , width: 111-113 μm .

Dorsal side (Fig. 71): Rostrum convex medially, slightly nasiform. Laterally three large teeth, separated by two deep incisions (Fig. 73). Rostral setae strongly curved inwards, geniculate. Between the narrow fenestrate spots a wide area present, ornamented by large tubercles. Lamellar knob divided in two parts but connected with the interlamellar knobs. Interbothridial region with some light spots. Sensillus with rounded and well-thickened head covered by short spicules arranged in longitudinal rows. Notogastral teeth of anterior margin blunt at tip, median pair broadly rounded. Both pairs are continuing backwards in keels, lateral keels of median teeth longer than the others and reaching beyond the round median spot. Nine pairs of phylliform notogastral setae present, among them ps_1 and ps_2 shorter than the anterior ones.

Ventral side (Fig. 72): Apodemes, also the sternal ones well developed, epimeral surface slightly convex medially. On the 2nd and sejugal apodemes a bridge-like interruption present. Five pairs of long genital setae, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. Setae ad_2 and ad_3 originating in preanal, ad_1 in paraanal position.



FIGS 71-73.

Suctobelbella foliosa sp. n. — 71: dorsal side, 72: ventral side,
73: rostral part of prodorsum from lateral view.

Material examined: Holotype: Pal-83/13, 1 paratype: from the same sample. Holotype: MHNG, paratype (1010-PO-84): HHNM.

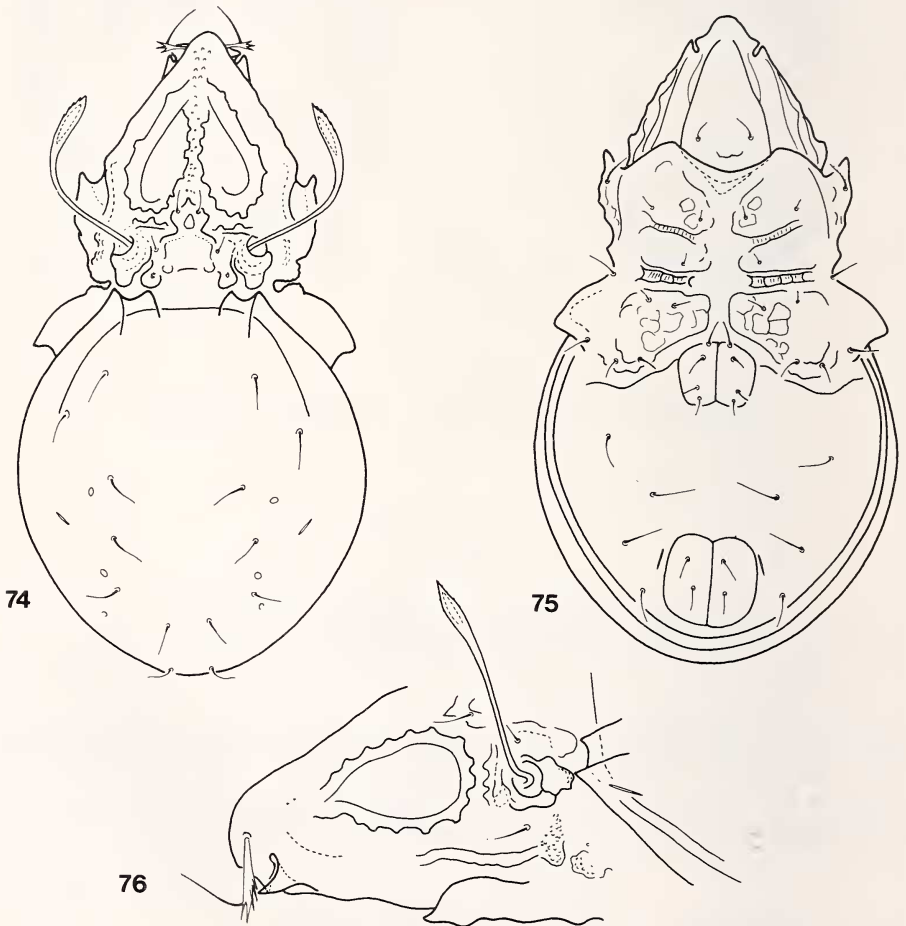
Remarks: On the ground of the phylliform notogastral setae the new species is well distinguished from all related *Suctobelbella* Jacot, 1937 species.

***Suctobelbella sabahensis* sp. n.**

Measurements: Length: 192-211 μm , width: 110-177 μm .

Dorsal side (Fig. 74): Rostrum nasiform, rostral setae geniculate. Rostral lobe deep, two strong rostral teeth, partly in opposit position (Fig. 76). Dorsal part of

rostrum with numerous granules, some of them existing also between the fenestrate spots. These latter formations well framed laterally, the frame tuberculate. Lamellar knob sharply pointed anteriorly, connected with interbothridial ridges, lamellar setae short. Between the fenestrate spots and bothridium a strong transverse lath present. Bothridium with a large tubercle on its posterior margin. Sensillus very long, its head finely spiculate, directed forwards. Anterior margin of notogaster with two pairs of teeth, lateral pair slightly greater than the inner one. They are well separated from each other, but the keels between them are short. Nine pairs of notogastral setae present, all short, simple, hardly curved.



FIGS 74-76.

Suctobelbella sabahensis sp. n. — 74: dorsal side, 75: ventral side, 76: prodorsum from lateral view.

Ventral side (Fig. 75): Among the epimeral setae *lc* stronger than the others. Epimeral surface ornamented by scattered spots. Four pairs of genital setae present, anal and adanal setae thin, simple and comparatively long.

Material examined: Holotype: Pal-83/8, 3 paratypes: from the same sample, 1 paratype: Pal-83/13. Holotype and 3 paratypes: MHNG, 1 paratype (1011-PO-84): HHNM.

Remarks: The new species stands very near to *Suctobelbella dispersosetosa* Hammer, 1979. It is distinguished from the latter by the following features:

dispersosetosa Hammer, 1979

1. Lateral frame of fenestrate spots thin and smooth.
2. Sensillus smooth.
3. Lateral teeth of notogaster very long and pointed, much longer than median ones.
4. The border of lateral teeth long, reaching to setae *ta*.

sabahensis sp. n.

1. Lateral fame of fenestrate spots thick, with some tubercles.
2. Sensillus finely spiculate.
3. Lateral teeth of notogaster not or scarcely longer than the median ones.
4. The border of lateral teeth short, ending far from setae *ta*.

***Suctobelbilla baderi* sp. n.**

Measurements: Length: 161-169 μm , width: 96-99 μm .

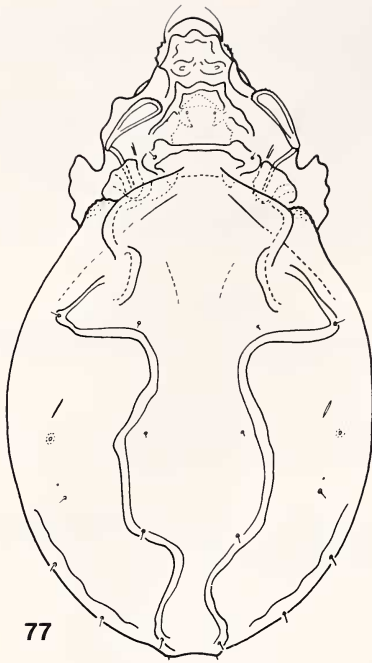
Dorsal side (Fig. 77): Lateral side of rostrum with numerous teeth (Fig. 79). Rostral setae smooth, straight, arising laterally. Prodorsal surface with three stronger transversal chitinous laths, some smaller tubercles and also longitudinal laths resembling costulae laterally. Sensillus large, its head hatchet-shaped. Crest running in zig-zag, some minute notogastral setae (*ti*, *r*₂, *r*₁) originating on it. Anterior margin of notogaster also bearing a pair of small tubercles, its surface granulate. Lamellar and interlamellar setae minute, exobothridial setae longest of all prodorsal setae. Notogastral surface with a pair of longitudinal crests, without a round projection.

Ventral side (Fig. 78): First and second epimeres with only a few, third and fourth ones with some irregular rugae. Epimeral region well framed laterally. All epimeral setae minute. Epimere IV with four pairs of setae, among them three pairs originating very near to each other. Five pairs of genital, one pair of aggenital, three pairs of adanal and two pairs of anal setae present. Ventral plate with a polygonate sculpture consisting of mostly short ribs laterally and tubercles medially.

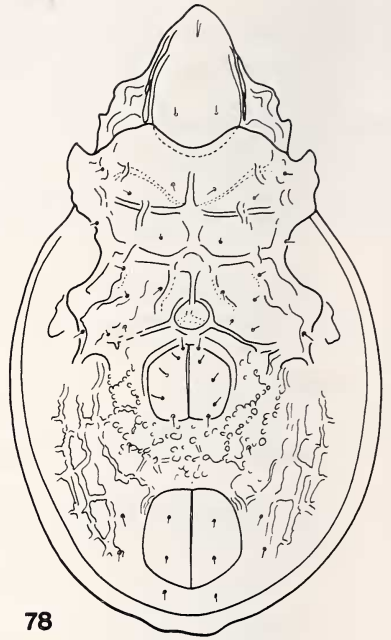
Material examined: Holotype: Pal-83/13, 1 paratype: from the same sample. Holotype: MHNG, paratype (1012-PO-84): HHNM.

Remarks: The new species is well characterized by a pair of longitudinal crests on the notogaster. They are unique within the genus *Suctobelbilla* Jacot, 1937.

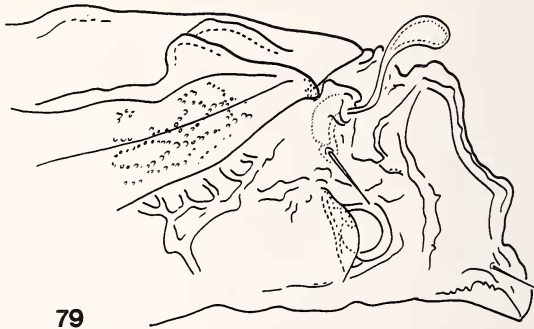
I dedicate the new species to Dr. C. Bader (Basle), the renowned acarologist.



77



78



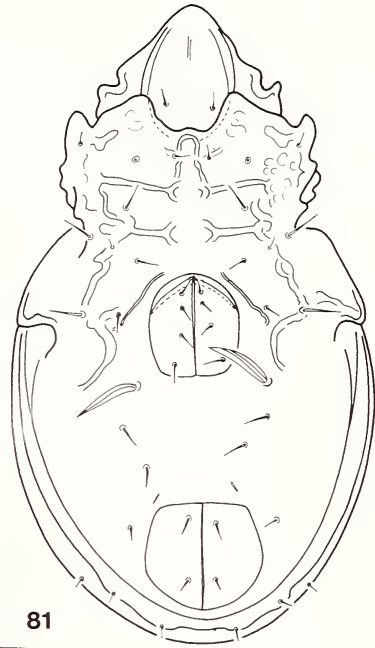
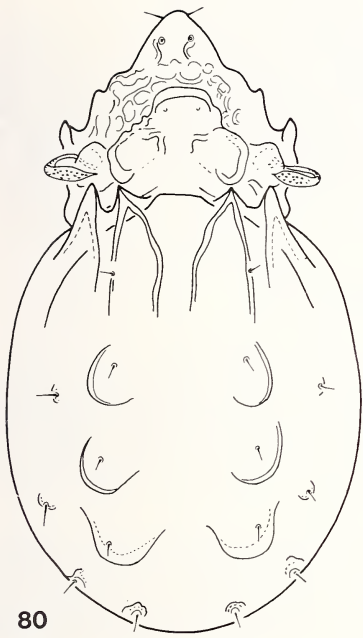
79

FIGS 77-79.

Suctobelbilla baderi sp. n. — 77: dorsal side, 78: ventral side, 79: prodorsum from lateral view.

Suctobelbiloides gen. n.

D i a g n o s i s : Family *Suctobelbidae* Grandjean, 1954. Rostrum rounded, rostral setae short, simple, arising dorsally. Anterolateral margin of prodorsum without teeth. Surface of prodorsum reticulate, a large transversal rib present, fenestrated spots and lamellar knob absent. Sensillus short, with clavate head. Anterior margin of notogaster with two pairs of large teeth, both pairs continuing backwards in a pair of strong keels.



FIGS 80-82.

Suctobelbiloides armatus gen. n., sp. n. — 80: dorsal side, 81: ventral side, 82: prodorsum from lateral view.

Three pairs of larger protuberances medially and four pairs of small ones laterally present. Four pairs of genital, one pair of aggenital, three pairs of adanal and two pairs of anal setae present. Genital setae very large, sword-shaped, setae ad_1 in paraanal, ad_2 and ad_3 in preanal (!) position. Pori *iad* situated also in front of the anal opening.

Type species: *Suctobelbiloides armatus* sp. n.

Remarks: The new taxon unites in itself some characters of different genera as *Suctobelba* Paoli, 1908, *Suctobelbella* Jacot, 1937, *Suctobelbila* Jacot, 1937 and *Fenestrobrelba* Balogh, 1970. It is distinguished from *Suctobelba* and *Suctobelbella* by the prodorsal surface and the absence of rostral incisura and teeth, from *Suctobelbila* by the two pairs of strong teeth on notogaster, from *Fenestrobrelba* by the seven pairs of notogastral tubercles.

***Suctobelbiloides armatus* sp. n.**

Measurements: Length: 188-192 μm , width: 108-110 μm .

Dorsal side (Fig. 80): Prodorsal surface excavated medially and with one unpaired and two paired large projections basally. They are well observable in lateral view (Fig. 82). All setae short, hardly discernible. Pedotecta I with some small teeth on its ventral margin. Teeth of notogaster very large, between the inner pair dorsosejugal suture thinned medially. All notogastral setae minute and simple.

Ventral side (Fig. 81): Sternal apodeme developed, epimeral surface slightly excavated medially. Apodemes and bordures only partly developed, no transversal band in front of genital opening. Epimeral surface with some ribs, and chitinous laths. Epimeral setae long and strong, some of them dagger-shaped. Among the anal and adanal setae ad_1 the shortest.

Material examined: Holotype: Pal-83/13, 1 paratype: from the same sample. Holotype: MHNG, paratype (1013-PO-84): HNHM.

Remarks: On the basis of the differences given in the differential diagnosis after the description of the genus, this species differs from all related taxa.

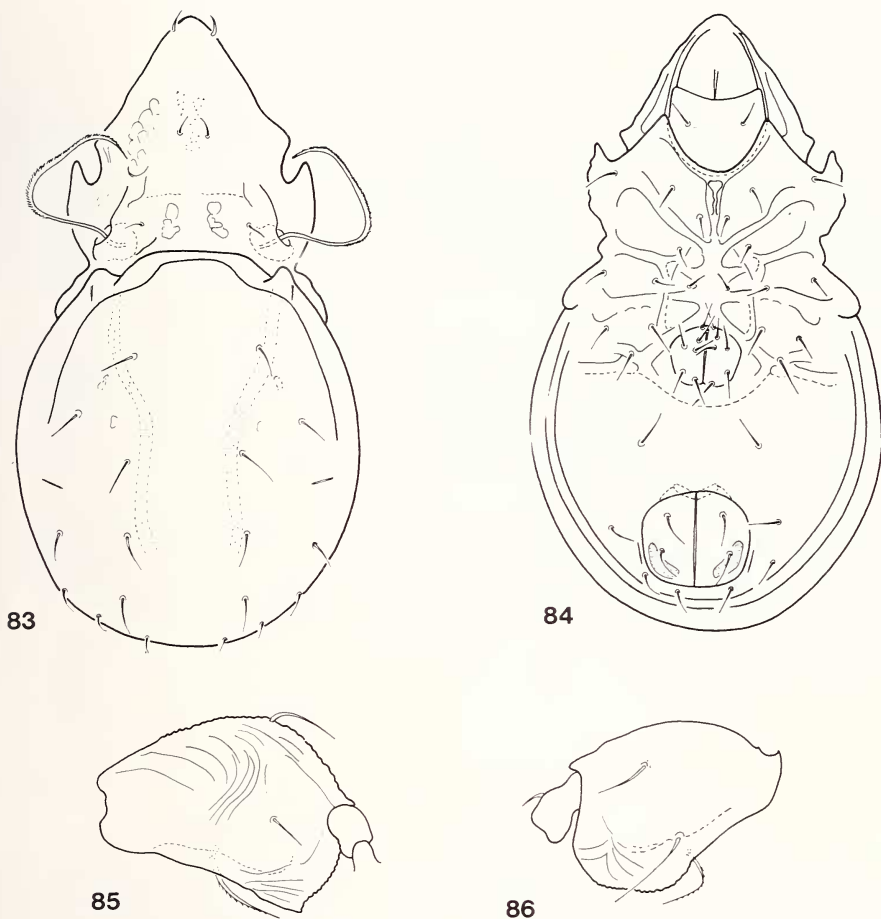
***Tecteremaeus incompletus* sp. n.**

Measurements: Length: 341-386 μm , width: 193-278 μm .

Dorsal side (Fig. 83): Rostrum rounded, rostral setae thicker than lamellar or interlamellar ones, both latter pairs thin and simple. Prodorsal surface with small granules, costulae absent, only short lines run forwards from bothridium. Three pairs of light spots present in the interbothridial region. Sensillus typical for the genus, strongly curving forwards. Notogaster with a pair of a long border composed of small granules, directed backwards and reaching to setae r_1 . Only nine pairs of notogastral setae present, setae ta absent. Four pairs of setae in posteromarginal position, much shorter than the others.

Ventral side (Fig. 84): Epimeral surface with a framed, deepening hollow in the middle. Apodemes well developed, composing a dense network. All epimeral setae strong, erect, slightly spiniform. Six pairs of genital, one pair of aggenital, all anal and adanal setae comparatively long and strong. A pair of areae porosae on the anal plates of males present.

Legs: Femur of legs I-IV characteristically widened, border serrate (Figs 85-86).



FIGS 83-86.

Tecteremaeus incompletus sp. n. — 83: dorsal side, 84: ventral side, 85: femur of leg IV, 86: femur of leg II.

Material examined: Holotype: Pal-83/8, 11 paratypes: from the same sample. Holotype and 7 paratypes: MHNG, 4 paratypes: (1014-PO-84): HNHM.

Remarks: The new species is characterized by the lack of prodorsal costulae, the nine pairs of notogastral setae and the border of femora I-IV. It stands nearest to *Tecteremaeus bogorensis* Hammer, 1979, however, the latter species has 10 pairs of notogastral setae and the contour of its femora II and IV differs from the new species. The other *Tecteremaeus* species from South America have either well-developed costulae or 10 pairs of notogastral setae.

Machadobelba descombesi sp. n.

Measurements: Length: 411-421 μm , width: 208-218 μm .

Dorsal side (Fig. 91): Rostrum with two small tubercles laterally, rostral setae arising behind them, these and all other prodorsal setae thin, only finely ciliate. Lamellae simple, short, ending far from the insertion points of rostral setae, basally ending in large tubercles, which are opposite to the inner notogastral tubercles. Sensillus simple, typical for the genus. Border of pedotecta I smooth, lateral part of prodorsum with large tubercles. Median notogastral condyles small, with two small teeth, lateral notogastral condyles sharply pointed. Ten pairs of simple, thin, but well-ciliate notogastral setae, five pairs longer than the others.

Ventral side (Fig. 92): Typical for the genus. Epimeral surface ornamented by polygonal reticulation. Six pairs of genital setae present, anterior one much longer than the others. Aggenital, anal and adanal setae short, setae ad_2 and ad_3 in paraanal position.

Material examined: Holotypus: Pal-83/8, 1 paratype: from the same sample. Holotype: MHNG, paratype (1015-PO-84): HNHM.

Remarks: The new species belongs to the species-group which may be characterized by the simple notogastral setae. It stands nearest to *Machadobelba tuberculata* Csiszár, 1961, however, the lamellae of the latter are much longer, reaching to the insertion points of the rostral setae and setae r_1 are nearly as long as r_2 or r_3 .

I dedicate the new species to Mr R. Descombes, Administrative Director of the Muséum d'Histoire naturelle, Geneva, for his aiding in our work.

Machadobelba similis sp. n.

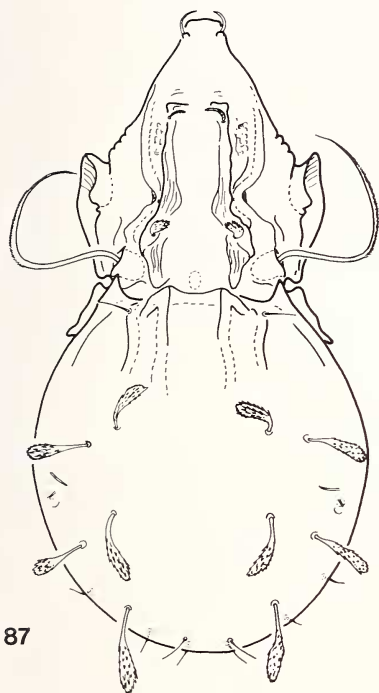
Measurements: Length: 416-426 μm , width: 218-228 μm .

Dorsal side (Fig. 87): Rostrum with two small, round tubercles. Rostral setae slightly dilated, smooth, lamellar setae pilose, interlamellar setae strongly dilated, its surface spiculate. Lamellae well developed, with longitudinal striation, but without tubercles. Basal tubercles large, also with longitudinal lines (Fig. 89). Pedotecta I with serrate and divided margin. Sensillus typical for the genus. Notogaster with a complicate sculpture on its anterior margin, median pair of tubercles blunt, not clearly separated from the sharply pointed lateral ones. Ten pairs of notogastral setae present, five pairs well dilated, spatulate or phylliform, setae ta and r_1 simple, much shorter than the others and only finely ciliate. Setae ps_1 - ps_3 short.

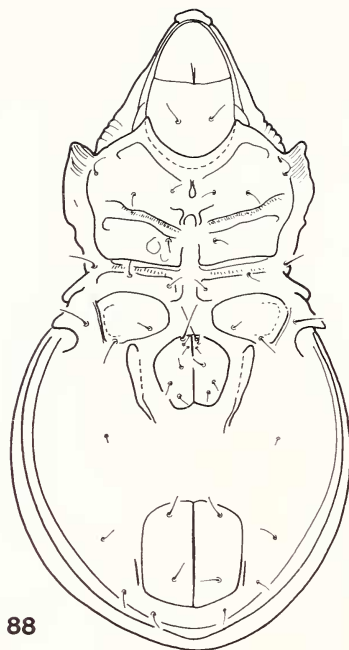
Ventral side (Fig. 88): Well chitinized, but epimeral surface ornamented by only a few spots. Epimeral setae simple. Anogenital region very similar to that of the other species of this genus.

Material examined: Holotype: Pal-83/13, 4 paratypes: from the same sample. Holotype and 2 paratypes: MHNG, 2 paratypes (1016-PO-84): HNHM.

Remarks: The new species is very similar to *Machadobelba spathulifer* Mahunka, 1987 from Sabah, however, the latter has very complicated lamellae (Fig. 90), but the basal condyles are never lineated. The most important character: its setae ta also dilated and spiculate, while setae ta of the new species is simple, only finely ciliate.



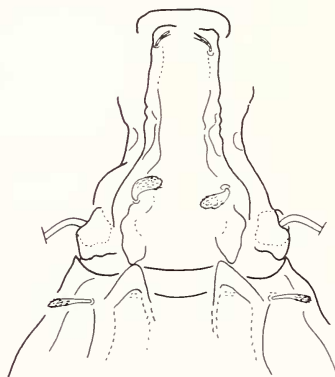
87



88



89

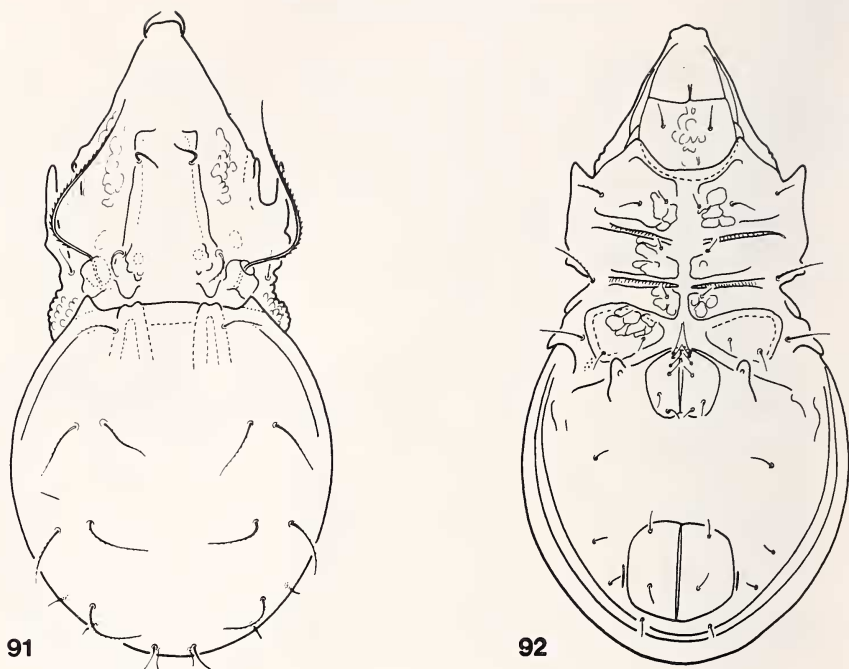


90

FIGS 87-90.

Machadobelba similis sp. n. — 87: dorsal side, 88: ventral side,
89: median part of body from dorsal view.

Machadobelba spathulifer Mahunka, 1987 — 90: median part of body from dorsal view.



FIGS 91-92.

Machadobelba descombesi sp. n. — 91: dorsal side, 92: ventral side.

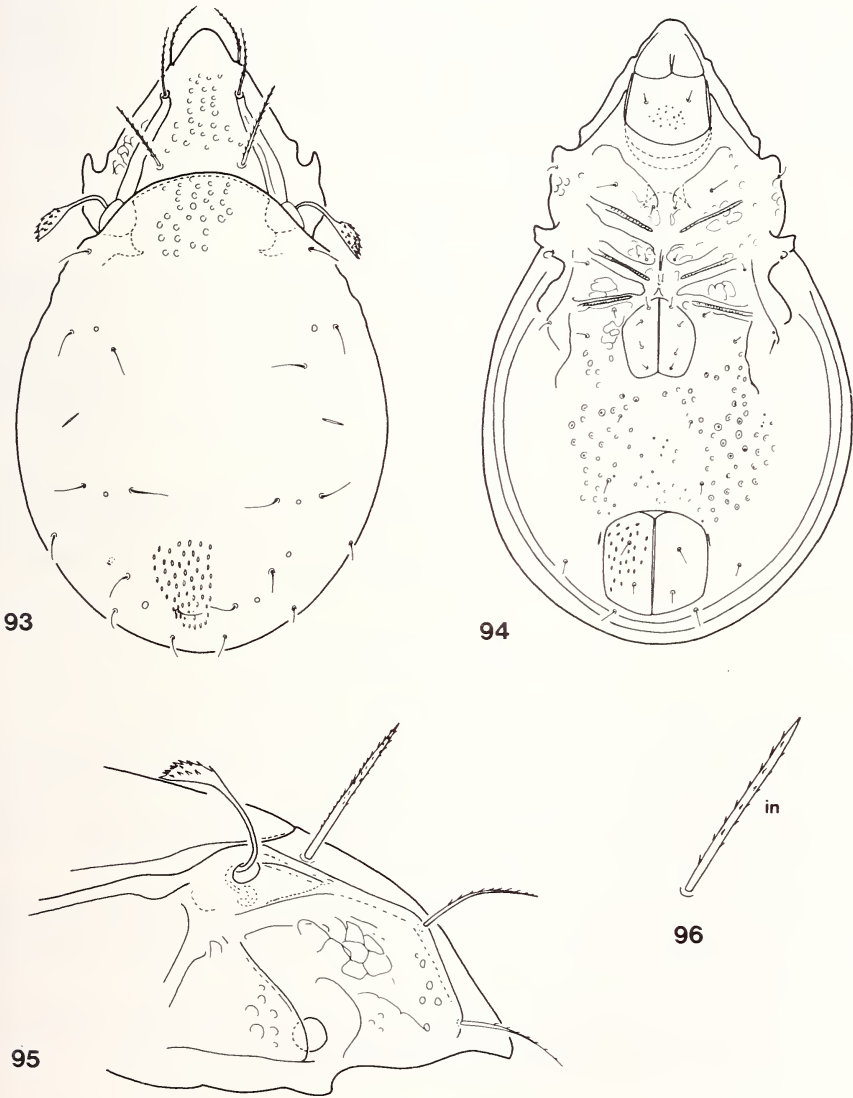
***Tuberemaeus nagaii* sp. n.**

Measurements: Length: 356-382 μm , width: 198-223 μm .

Dorsal side (Fig. 93): Rostrum rounded, lamellae originating comparatively far from the lateral margin of notogaster. Rostral setae thin, lamellar and especially interlamellar setae strong, slightly thickened, and thinned only at the distal end (Fig. 96). Lamellar and interlamellar setae rather ciliate. Rostrum and the basal part of prodorsum without foveolae, in the interlamellar region some large foveolae present. Lateral part of prodorsum (Fig. 95) polygonate, also some foveolae present. Sensillus directed backwards, its head asymmetrically spiculate. The endspine not or only slightly longer than the spicula of its surface. The lateral margin of notogaster slightly undulating. The foveolae large and round anteriorly, on the posterior margin resembling narrow slits. Ten pairs of notogastral setae, thin and simple.

Ventral side (Fig. 94): Lateral part of pedotecta I with large foveolae, epimeral surface only scarcely foveolate. Epimeres I bearing 4-5 comparatively large foveolae, epimeres II-IV ornamented only with weak polygonate sculpture, foveolae or

round spots not observable. Epimeral setae simple, *1b* much longer than *1c*. Genital, anal and adanal setae also simple, setae *ad*₃ arising far in front of anal opening. Surface of genital plate smooth, anal plate with thin and small foveolae, on median part only some smaller, laterally larger and stronger foveolae visible, medially also some fields without foveolae.



FIGS 93-96.

Tuberemaus nagai sp. n. — 93: dorsal side, 94: ventral side, 95: prodorsum from lateral view, 96: interlamellar seta.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 14 paratypes: from the same sample, 23 paratypes: Pal-83/5. Holotype and 23 paratypes: MHNG, 14 paratypes (1017-PO-84): HNHM.

R e m a r k s : The new species is related to the "*perforatoides*-group". This group is well characterized by the foveolae becoming gradually smaller on the posterior part of notogaster. It stands near to *Tuberemaus perforatoides* Hammer, 1979, however, the rostrum is well foveolate in the latter and smooth in the new species, and the epimeral surface of *perforatoides* is also foveolate (see HAMMER 1979: 54) while it is polygonate in the new species.

I dedicate the new species to Mr S. Nagai, for his continuous help during the collection trips of Dr. B. Hauser.

Bischeloribates gen. n.

D i a g n o s i s : Family *Schelorbitidae*. Lamellae long, lamellar setae arising on their cusps, prelamellae very short, not reaching to the insertion points of rostral setae. Sensillus clavate. Dorsosejugal suture present. Four pairs of sacculi and ten pairs of minute setae or their alveoli observable on the notogaster. Four pairs of genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae visible. Pori *iad* in adanal, setae *ad*₃ in preanal position. All legs bidactylous, strong heterodactylia present.

T y p e s p e c i e s : *Bischeloribates heterodactylus* sp. n.

R e m a r k s : The new taxon belongs to the family *Schelorbitidae* Grandjean, 1954 and on the ground of its habitus and chaetotaxy it appears very similar to the genus *Schelorbitates* Berlese, 1908. But all the heretofore known species * of this genus are tridactylous, therefore, the establishment of a new genus is inevitable **.

Bischeloribates heterodactylus sp. n.

M e a s u r e m e n t s : Length: 282-302 μm , width: 188-213 μm .

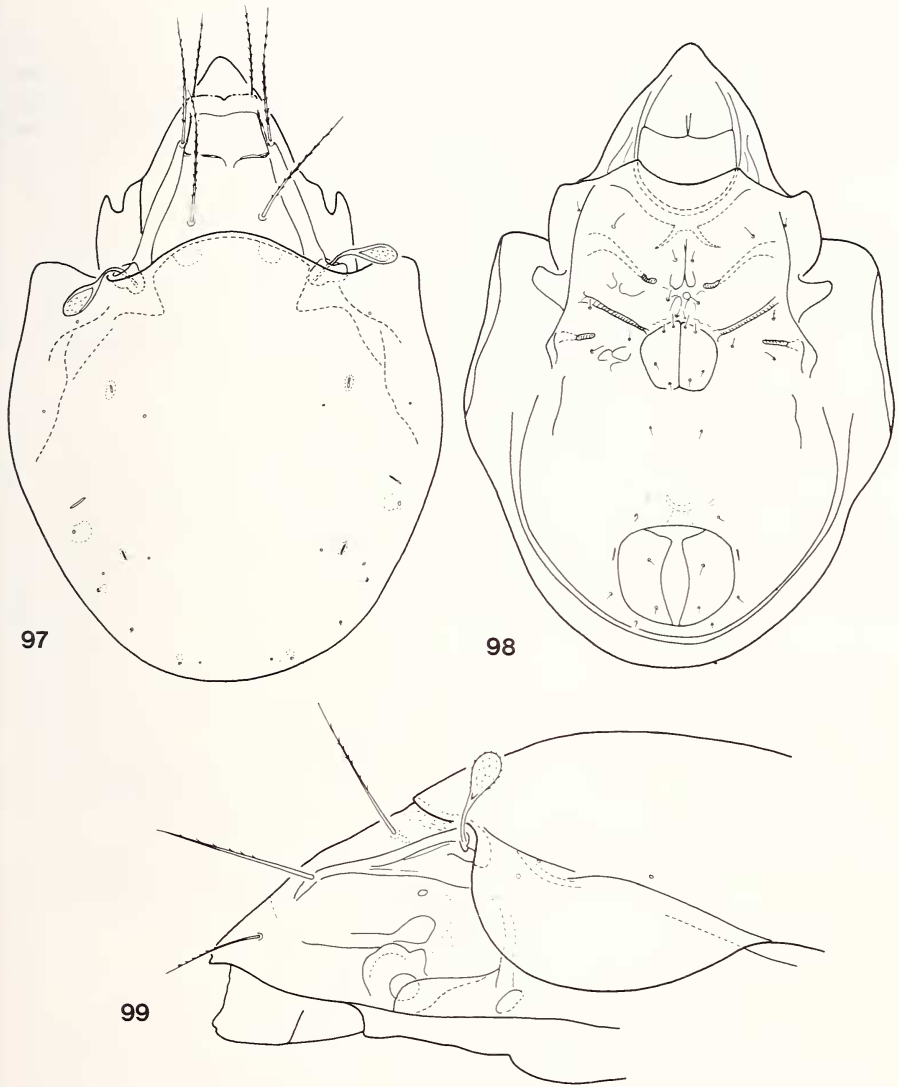
D o r s a l s i d e (Fig. 97): Rostrum rounded, rostral setae arising marginally on small tubercles. Between the rostral setae a fine, between the lamellar setae a stronger transversal line present. All prodorsal setae strong, long, finely ciliate (Fig. 99). Sensillus with a well developed, rounded head, its surface spiculate, its peduncle arched. Sacculi small, but *Sa* greater than the other three pairs.

V e n t r a l s i d e (Fig. 98): Epimeral surface scarcely ornamented. All epimeral setae fine and simple. Ventral plate smooth, only a characteristic curved line observable laterally on it. All setae in anogenital region very short and fine. Setae *ad*₃ stands in front of anal opening.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 1 paratype: from the same sample. Holotype: MHNG, paratype (1018-PO-84): HNHM.

* *Protorbitates* (*Schelorbitates*) *biunguis* Berlese, 1920 belongs probably to this genus but I have not seen the type.

** The taxonomical value of the number of claws in the superfamily Oribatuloidea is uncertain. A revision is deemed necessary.



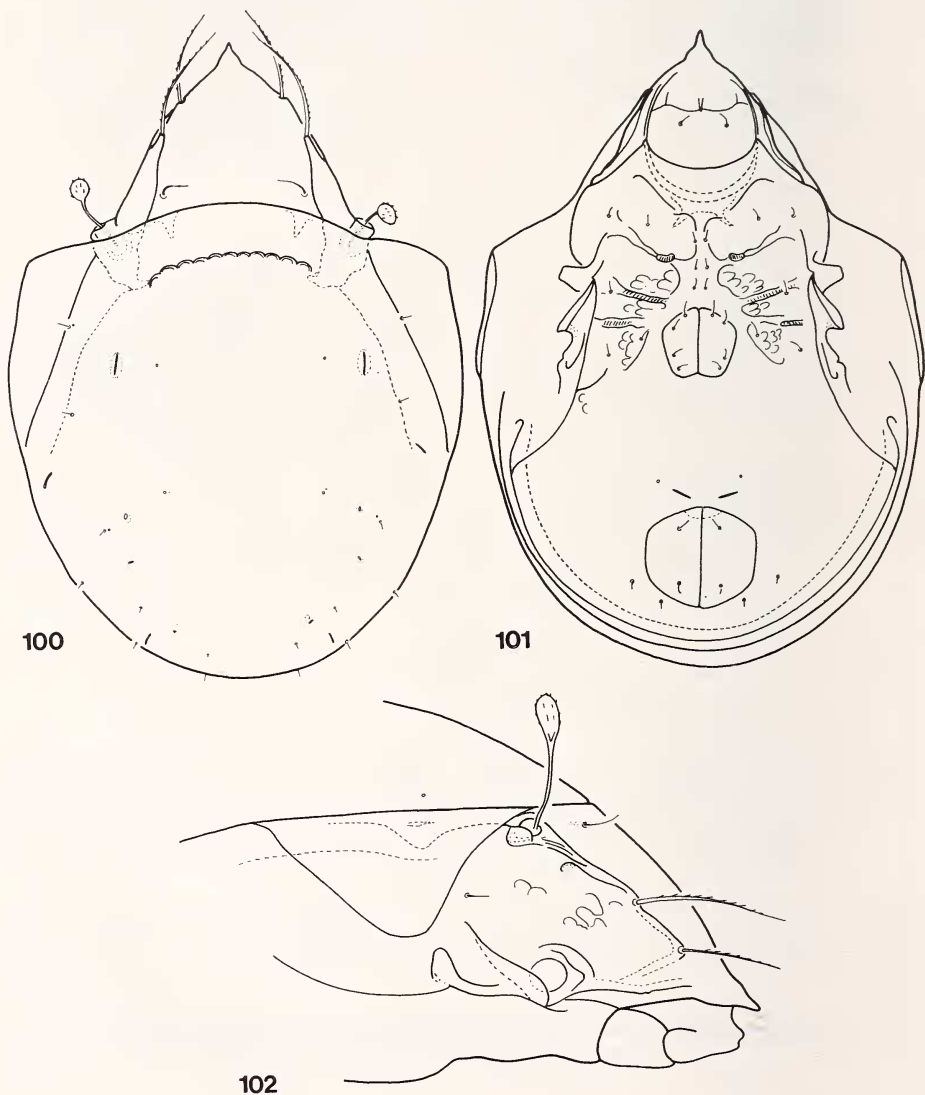
FIGS 97-99.

Bischeloribates heterodactylus gen. n., sp. n. — 97: dorsal side, 98: ventral side, 99: prodorsum from lateral view.

R e m a r k s : The new species is distinguished from all closely related *Scheloribates* species by the number of claws, from *Protoribates* (*Scheloribates*) *biunguis* Berlese, 1920 by the great difference in their measurements: the latter 420 μm long and 270 μm wide.

Coronibatula gen. n.

Diagnosis: Family *Schelorbitidae*. Rostrum elongated, sharply pointed. Lamellae and prelamellae well developed, lamellar and rostral setae originating on their cusps. Interlamellar setae much shorter than both preceding pairs. Sensillus with long



FIGS 100-102.

Coronibatula lienhardi gen. n., sp. n. — 100: dorsal side, 101: ventral side, 101: prodorsum from lateral view.

peduncle, its head clavate. Dorsosejugal suture present, pteromorphae immovable. Ten pairs of minute notogastral setae, four pairs of sacculi well observable. Prodorsal surface smooth, on notogaster parallel with the dorsosejugal suture a characteristic sculpture present, it consists of 10-12 small semilunar formations. Epimeral setal formula: 3-1-2-2 (!). Four pairs of genital, two pairs of anal and three pairs of adanal setae present. Aggenital setae absent. Setae ad_3 in preanal position, before pori *iad*. All legs monodatyloous.

Type species: *Coronibatula lienhardi* sp. n.

Remarks: The new genus is related to the genus *Scheloribates* Berlese, 1908. It is characterized by the absence of the aggenital setae, by the existence of only one claw on all legs and by the position of setae ad_3 and of pori *iad*. Only one genus without aggenital setae is known in this family (*Neoscheloribates* Hammer, 1973), however, it is distinguished from the new taxon by many other characters.

***Coronibatula lienhardi* sp. n.**

Measurements: Length: 252-277 μm , width: 178-198 μm .

Dorsal side (Fig. 100): Prodorsal surface smooth. Laterally (Fig. 102), beside the lateral margin, a fine crest with some teeth present. Lamellae and prelamellae running continuously. Head of sensillus scarcely pilose. First pair of sacculi slit-like, much larger than the others.

Ventral side (Fig. 101): All epimeral setae short and simple. Epimeral surface with some irregular spots. All setae in the anogenital region short and fine.

Material examined: Holotype: Pal-83/8, 11 paratypes: from the same sample, 4 paratypes: Pal-83/5. Holotype and 10 paratypes: MHNG, 5 paratypes (1019-PO-84): HNHM.

Remarks: The new species stands far from all the other species in this family.

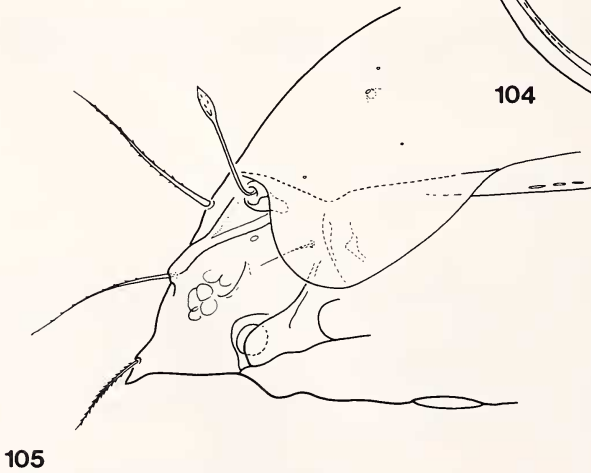
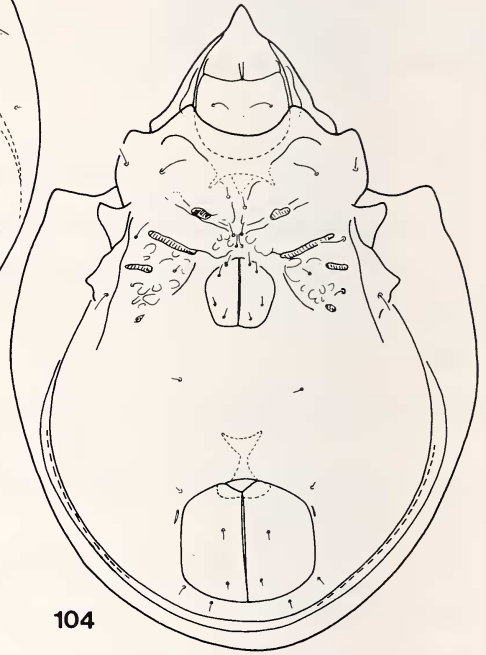
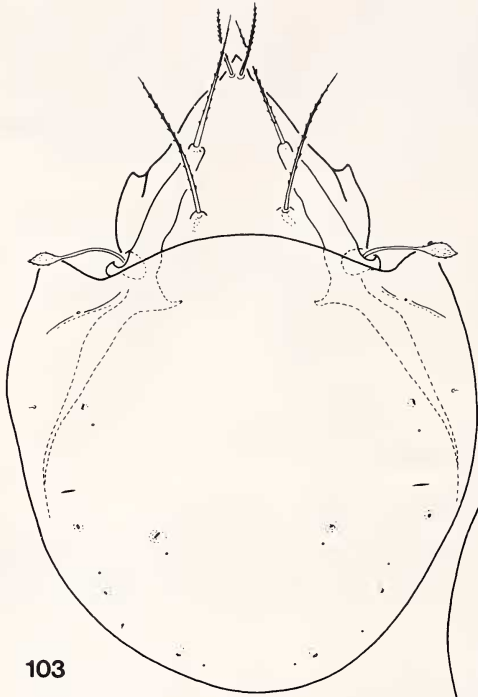
I dedicate the new species to Dr. C. Lienhard, Research Officer at the Muséum d'Histoire naturelle, Geneva, for his help in my work.

***Scheloribates aelleni* sp. n.**

Measurements: Length: 386-445 μm , width: 267-322 μm .

Dorsal side (Fig. 103): Rostrum sharply pointed, rostral setae strongly pilose, arising very near to each other: on the dorsal surface of rostrum. Lamellae well developed, but prelamellae absent. Lamellar setae arising on their cusps (Fig. 105), scarcely pilose. Interlamellar setae shaped like lamellar ones, but much longer than the latter. Sensillus very long, directed laterally, with a small, pilose head. Pteromorphae considerably large. Ten pairs of minute alveoli and four pairs of round sacculi present.

Ventral side (Fig. 104): Similar to the other species of this genus. Epimeral surface only with some irregular spots. Epimeral setae simple. Around the lateral margin of ventral plate some slit-like pori present. Four pairs of genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. All very short and simple. Setae ad_1 and ad_2 in postanal position.



FIGS 103-105.

Scheloribates aelleni sp. n. — 103: dorsal side, 104: ventral side, 105: prodorsum from lateral view.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 25 paratypes: from the same sample. Holotype and 15 paratypes: MHNG, 10 paratypes (1020-PO-84): HNHM.

R e m a r k s : The new species is well characterized and distinguished from all other *Schelorbates* Berlese, 1908 species by the sharply pointed rostrum and by the densely ciliate rostral setae originating very closely to each other.

I dedicate the new species to Prof. Dr. V. Aellen, the Director of the Muséum d'Histoire naturelle, Geneva.

Aokibates gen. n.

D i a g n o s i s : Family *Haplozetidae*. Prelamella short, a well-developed sublamella present, rostral setae arising on their cusps. Sensillus long, with a small and clavate head. Notogastral surface foveolate. Four pairs of sacculi and fourteen pairs of genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. Two or three pairs of areae porosae in marginal position. Legs I-III monodactylous, legs IV bidactylous.

T y p e s p e c i e s : *Aokibates yoshii* sp. n.

R e m a r k s : The new taxon is related to *Pelorbates* Berlese, 1908, however, it is the first genus of the family *Haplozetidae* which has partly monodactylous, partly bidactylous legs.

I dedicate the new taxon to Prof. Dr. J. Aoki, the renowned Oribatologist.

Aokibates yoshii sp. n.

M e a s u r e m e n t s : Length: 272-297 μm , width: 213-238 μm .

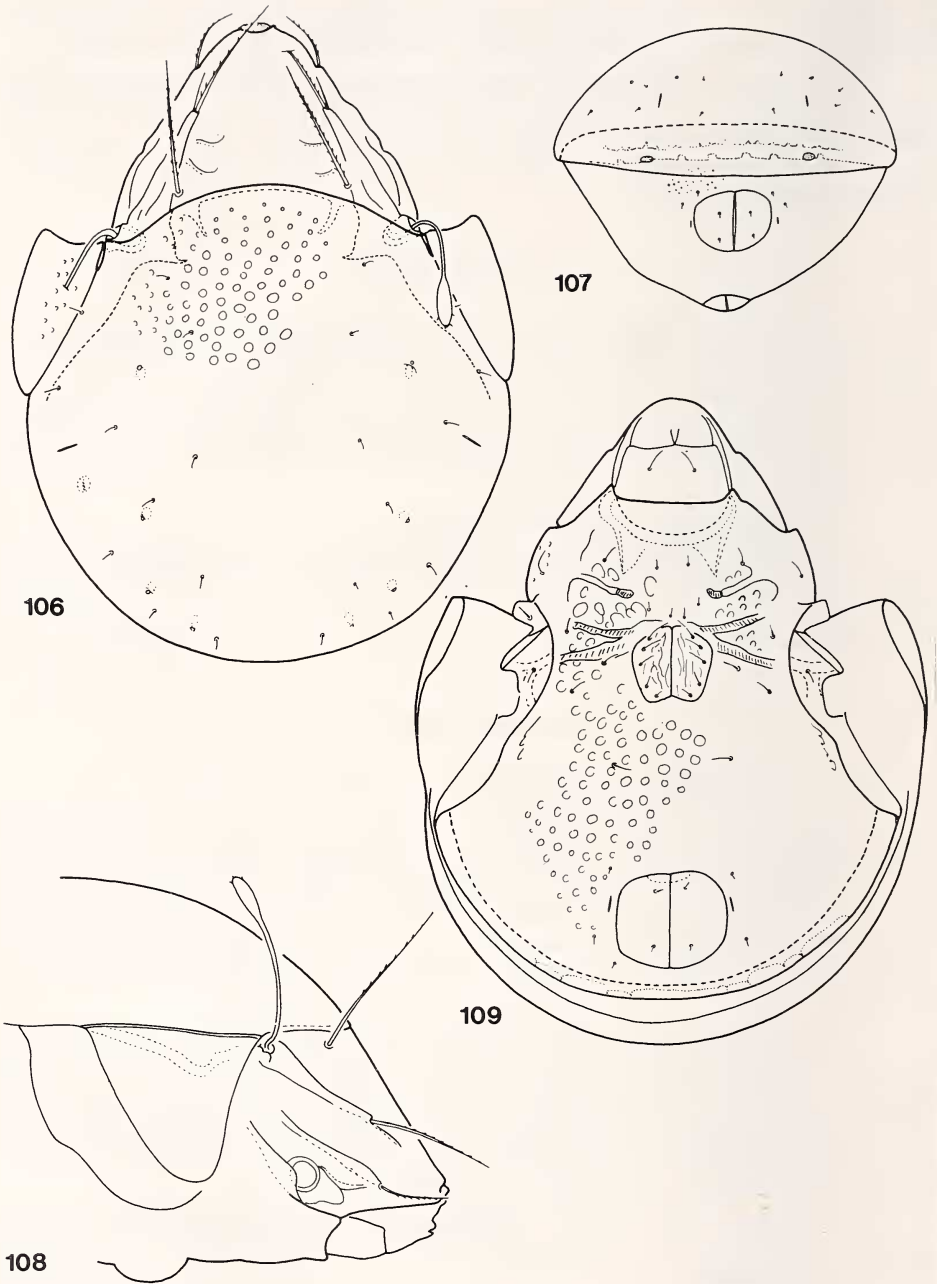
D o r s a l s i d e (Fig. 106): Rostrum truncate, its end punctate. Rostral, lamellar and interlamellar setae simple, its ratio: $in > le > ro$, all finely ciliate (Fig. 108). Head of sensillus with some cilia. In the interlamellar region some fine transversal ribs present, surface smooth. Dorsosejugal suture convex. Pteromorphae well developed, ornamented by small foveolae. Whole surface of notogaster foveolate, but foveolae in the anterior region smaller than in the middle or posterior part of notogaster. All setae very fine, hardly discernible.

V e n t r a l s i d e (Fig. 109): Epimeral surface ornamented with irregular spots, but behind sejugal apodemes, the ventral plate — with the exception of lateromarginal surface — foveolate, as is the notogastral surface. Epimeral setae simple and short. Surface of genital plates with longitudinal lines. Five pairs of comparatively long genital setae, anal and adanal setae minute. On the posterolateral margin of the ventral plate two or three pairs of small areae porosae present (Fig. 107).

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 35 paratypes: from the same sample, 7 paratypes: Pal-83/5. Holotype and 25 paratypes: MHNG, 17 paratypes (1021-PO-84): HNHM.

R e m a r k s : The new species stands on the ground of some characters very far from the other taxa of the family *Haplozetidae*.

I dedicate the new species to Prof. Dr. R. Yoshii (Kyoto), for his extensive help during the collecting trips of Dr. B. Hauser.



FIGS 106-109.

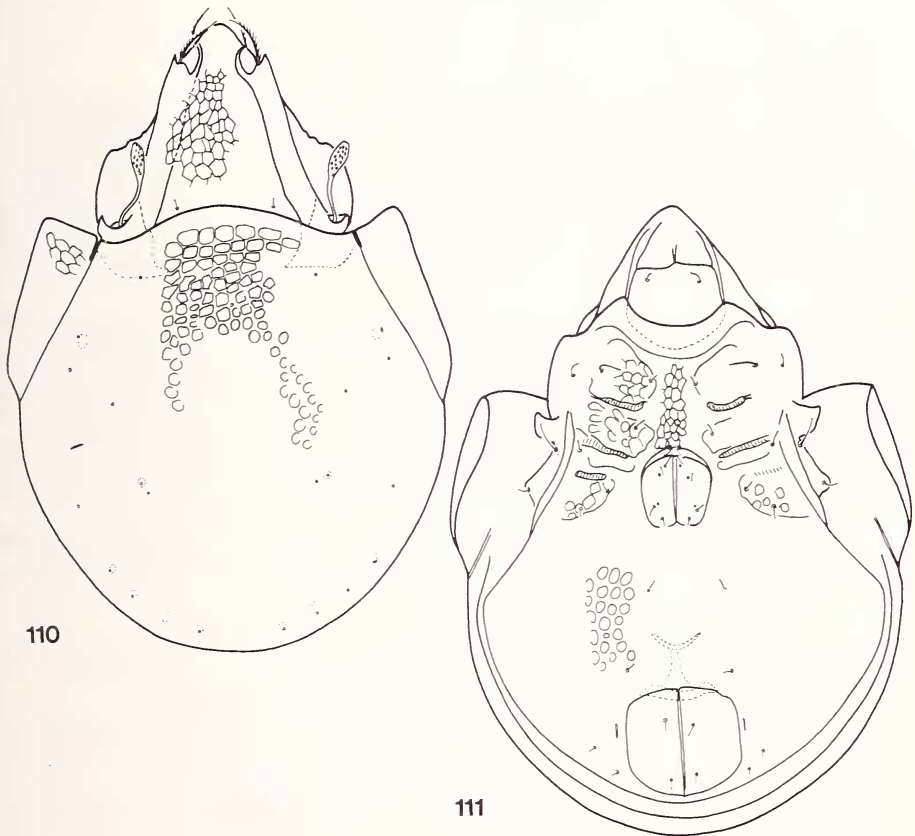
Aokibates yoshii gen. n., sp. n. — 106: dorsal side, 107: body from posterior view, 108: prodorsum from lateral view, 109: ventral side.

***Magyaria triungulata* sp. n.**

Measurements: Length: 381-396 μm , width: 257-287 μm .

Dorsal side (Fig. 110): Rostrum conical, rostral setae short, simple, finely barbed. Lamellae long, with a sharply pointed, long outer cuspis, lamellar setae arising near to it. A thin prelamella running from the inner side of lamellae anteriorly. Lamellar setae slightly stronger than rostral ones, interlamellar setae minute. Surface reticulate, the polygonal fields are smaller anteriorly and larger posteriorly. Sensillus clavate. Notogaster and pteromorphae as in other *Magyaria* species. Dorsal surface of notogaster also reticulate, however, a large area smooth medially. The polygonal fields are quadrate anteriorly and rounded posteriorly. All setae represented only by their alveoli.

Ventral side (Fig. 111): Apodemes and bordures not strongly chitinized. Epimeral surface also reticulate, but laterally partly smooth, or ornamented by irregular spots. Medially a separated reticulate part present. All epimeral setae short and simple.



FIGS 110-111.

Magyaria triungulata sp. n. — 110: dorsal side, 111: ventral side.

There are five pairs of genital setae present. Ventral plate with polygonate sculpture consisting of large foveolae. All setae in anogenital region short and simple. Setae ad_3 in preanal position.

L e g s : All legs tridactylous.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/13, 8 paratypes: from the same sample. Holotype and 5 paratypes: MHNG, 3 paratypes (1022-PO-84): HNHM.

R e m a r k s : The type species of the genus *Magyaria* Balogh, 1963 has only one claw, and all the other heretofore known *Magyaria* species — excepting the bidactylous *M. javensis* Hammer, 1979 — have one claw on their legs. The new species is distinguished from all the others by its tridactylous legs. This example also shows the ambiguous taxonomical value of the number of claws, as seen in the family *Scheloribatidae* (*Bischelorbates* gen. n.).

Phalacrozetes similis sp. n.

M e a s u r e m e n t s : Length: 257-292 μm , width: 188-203 μm .

D o r s a l s i d e (Fig. 112): Rostrum rounded, rostral setae comparatively long, arising far from each other, but on the dorsal surface. Lamellae long, lamellar setae arising on their cusps. Rostral and lamellar setae equal in length, interlamellar setae minute. Sensillus similar to that of the type species of the genus: long. Notogastral surface punctate. Areae porosae very small, A_3 and A_4 respectively originating between r_3 and r_2 and r_2 and r_1 . All setae very minute, often only the alveoli present. Pteromorphae triangular (Fig. 114).

V e n t r a l s i d e (Fig. 113): Epimeral surface ornamented only with fine sculpture. Apodemes and bordures weakly developed. All epimeral setae short and simple. Five pairs of genital setae present, the anterior one much longer than the others. Aggenital, anal and adanal setae very short. Setae ad_3 originating in front of pori *iad*.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 8 paratypes: from the same sample, 2 paratypes: Pal-83/5. Holotype and 6 paratypes: MHNG, 4 paratypes (1023-PO-84): HNHM.

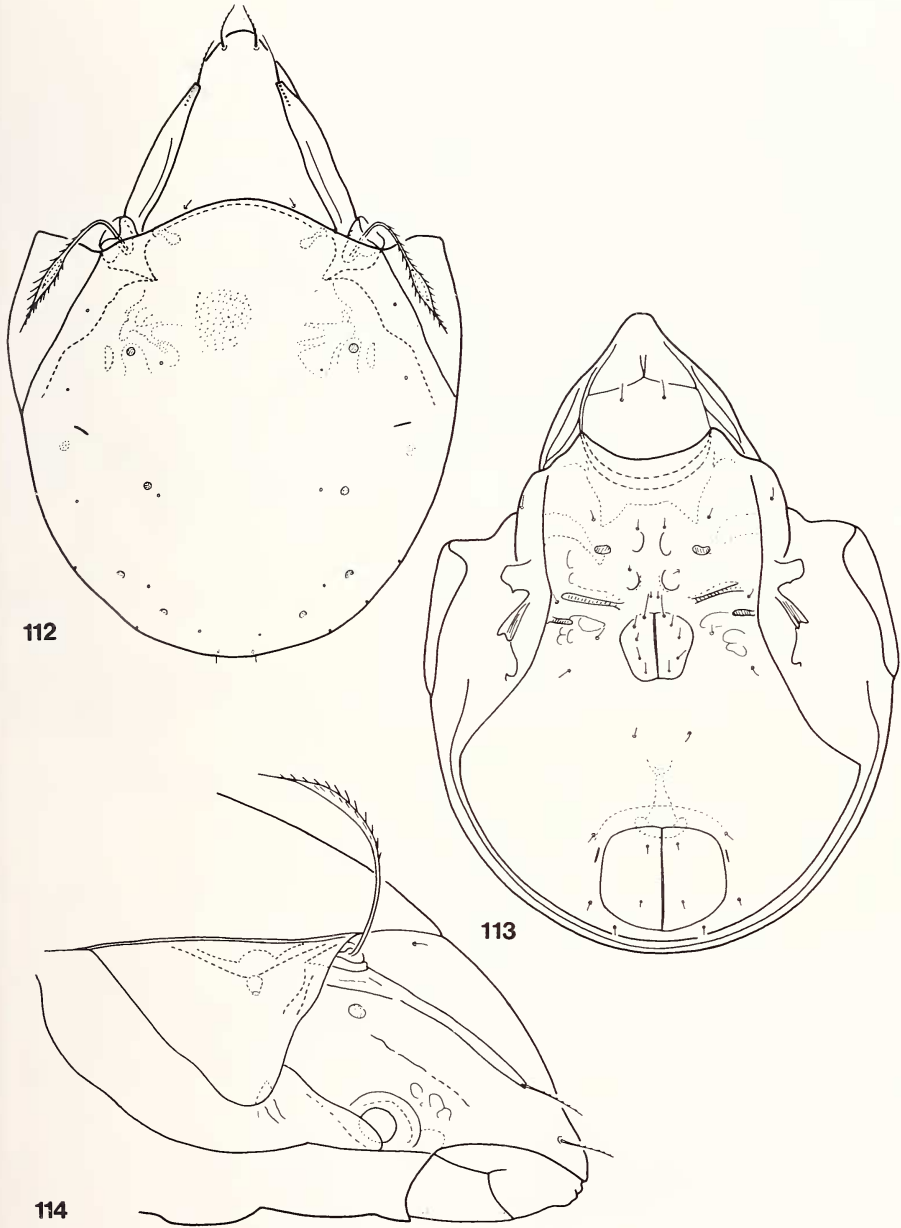
R e m a r k s : The new species is closely related to the type species of this genus from Thailand (*Phalacrozetes sinuatus* Aoki, 1965). The differences are tabulated below:

sinuatus Aoki, 1965

1. Rostral setae very short, shorter than distance between them.
2. Areae porosae A_3 originating laterally very near to pori *im* (?!).
3. Setae ad_3 originating behind pori *iad*.

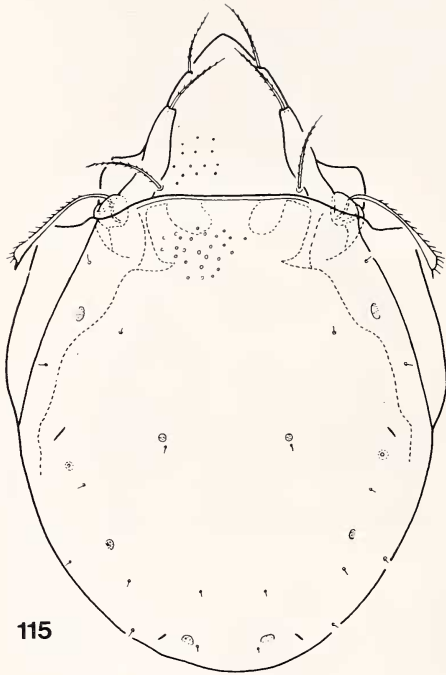
similis sp. n.

1. Rostral setae long, much longer than distance between them.
2. Areae porosae A_3 and A_4 originating respectively between setae r_3 and r_2 and between r_2 and r_1 .
3. Setae ad_3 originating in front of pori *iad*.

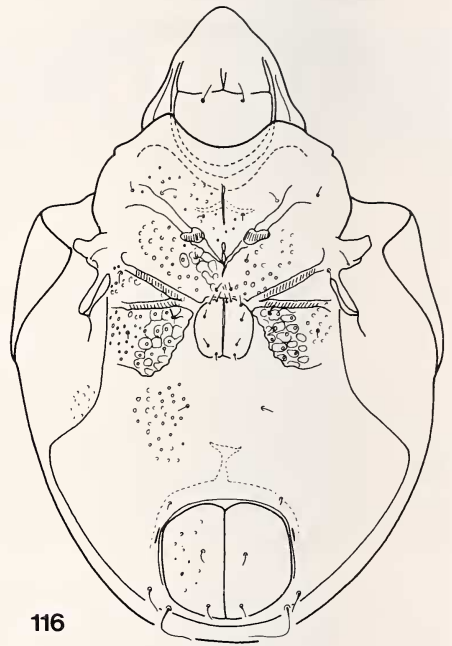


FIGS 112-114.

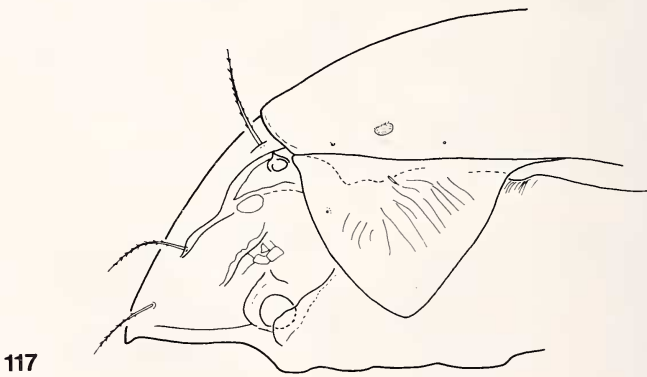
Phalacrozetes similis sp. n. — 112: dorsal side, 113: ventral side, 114: prodorsum from lateral view.



115



116



117

Figs 115-117.

Xylobates bisculpturatus sp. n. — 115: dorsal side, 116: ventral side,
117: prodorsum from lateral view.

***Xylobates bisculpturatus* sp. n.**

M e a s u r e m e n t s : Length: 448-583 μm , width: 332-373 μm .

D o r s a l s i d e (Fig. 115): Rostrum rounded, rostral setae arising laterally. Lamellae well developed, lamellar setae arising on their cusps (Fig. 117), both pairs thinner and shorter than the erectile interlamellar ones. Surface of prodorsum scarcely foveolate. Notogaster very wide. Dorsosejugal suture wavy, medially concave. Surface ornamented with larger foveolae than those on prodorsum. Four pairs of areae porosae and ten pairs of minute notogastral setae present.

V e n t r a l s i d e (Fig. 116): Apodemes and bordures partly well developed, sejugal and third apodemes connected medially. Epimeral surface partly foveolate, partly ornamented with irregular spots. Foveolae on epimere I smaller and more sparsely than on epimeres II or III. The double ornamentation mostly visible on epimere IV. The ornamentation of the ventral plate similar to that on notogaster. Five, sometimes six pairs of short genital, one pair of minute aggenital, two pairs of short anal and three pairs of different adanal setae present. Setae ad_1 very long, curved inwards, ad_2 only half as long as ad_1 , but slightly curved, ad_3 minute.

L e g s : All legs tridactylous.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 40 paratypes: from the same sample, 9 paratypes: Pal-83/5. Holotype and 31 paratypes: MHNG, 18 paratypes (1024-PO-84): HNHM.

R e m a r k s : The new species is well characterized by the concave dorsosejugal suture and the characteristic sculpture of the dorsal and ventral side. The combination of these characters has been unknown in the heretofore described species.

***Xylobates paracapucinus* sp. n.**

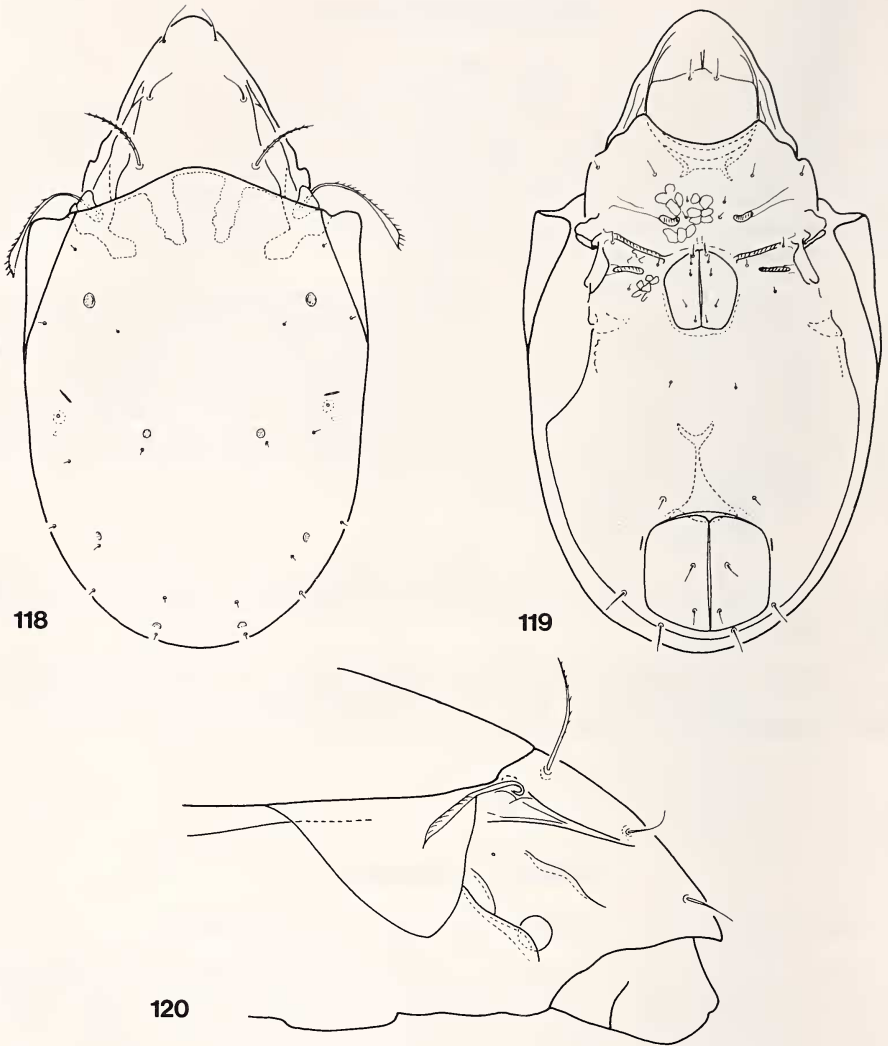
M e a s u r e m e n t s : Length: 337-371 μm , width: 188-208 μm .

D o r s a l s i d e (Fig. 118): Rostral and lamellar setae short, thin, interlamellar ones much stronger, thicker and longer than the two preceding pairs (Fig. 120). Lamellar setae arising on the dorsal surface of prodorsum, far from lamellae. Sensillus reclinate, with slightly asymmetrically dilated head and 12-13 short bristles on its outer margin. Pteromorphae triangular. Four pairs of small areae porosae and ten pairs of minute notogastral setae present.

V e n t r a l s i d e (Fig. 119): Apodemes and bordures weakly developed, epimeral surface with polygonate sculpture. Epimeral setae short and simple, epimeral setal formula: 3-1-3-2. Five pairs of short genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. Among the adanal setae ad_1 and ad_2 much longer than ad_3 , and both preceding pairs straight.

L e g s : All legs monodactylous.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 2 paratypes: from the same sample, 4 paratypes: Pal-83/5. Holotype and 4 paratypes: MHNG, 2 paratypes (1025-PO-84): HNHM.



FIGS 118-120.

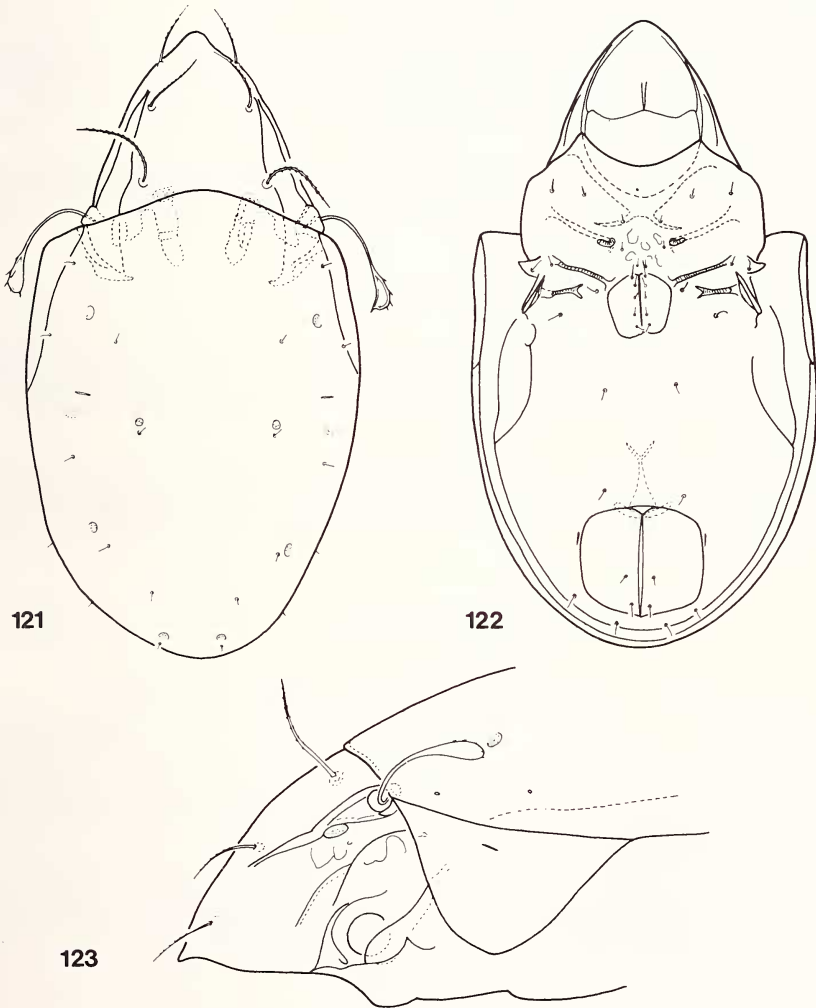
Xylobates paracapucinus sp. n. — 118: dorsal side, 119: ventral side,
120: prodorsum from lateral view.

Remarks: The new species stands very near to *Xylobates triangularis* Hammer, 1971 and *X. capucinus* Berlese, 1908, however, the latter has eleven pairs of notogastral setae, the preceding has more than 20 cilia on the sensillus and its areae porosae A_3 are located between setae p_1 and p_2 . The new species has ten pairs of notogastral setae, twelve bristles on its sensillus and its areae porosae A_3 are located between setae ps_1 and r_1 or between the two setae ps_1 .

***Xylobates rodriguezii* sp. n.**

Measurements: Length: 287-327 μm , width: 99-119 μm .

Dorsal side (Fig. 121): Rostral setae arising laterally on small tubercles. Lamellae gradually thinned forwards, lamellar setae arising on the dorsal surface of prodorsum. Interlamellar setae much longer and stronger than the preceding ones. All setae



FIGS 121-123.

Xylobates rodriguezii sp. n. — 121: dorsal side, 122: ventral side, 123: prodorsum from lateral view.

finely ciliate. Sensillus long, directed backwards, its head dilated, hatchet-like, outer border with 6-7 cilia, ending in a stronger spine. Notogaster elongated, pteromorphae nearly triangular (Fig. 123). Ten pairs of short notogastral setae and four pairs of small and round areae porosae observable.

Ventral side (Fig. 122): Apodemes weakly developed, sejugal apodemes reaching to the genital opening, *ap.* 3 directed slightly anteriorly. Epimeral surface, also medially, with some light spots. All epimeral setae fine and short, setae *4c* not visible (!). Five pairs of genital setae arranged in a longitudinal line. Aggenital setae sometimes represented only by their alveoli. Anal and adanal setae also minute.

Legs: All legs monodactylous.

Material examined: Holotype: Pal-83/8, 13 paratypes: from the same sample. Holotype and 8 paratypes: MHNG, 5 paratypes (1026-PO-84): HNHM.

Remarks: The new species is well distinguished from all closely related taxa by the form of its sensillus.

I dedicate the new species to Mr R. B. Rodriguez, Puerto Princesa (Palawan, Philippines), for his help during the collecting trip of Dr. B. Hauser in 1983.

Allozetes Berlese, 1913

The type species of the genus was described by BERLESE from Java. Since then the number of species rose due to the works of BALOGH (*A. africanus* Balogh, 1958) from Angola and HAMMER (*A. translamellatus* Hammer, 1973 and *A. dispar* Hammer, 1973) from Samoa.

The specimen from Sabah is identical with BERLESE's species, and it seems on the ground of the notogastral sculpture to be closely related to *Allozetes africanus* Balogh, 1958 *, therefore I give hereunder a short redescription with the differential characters between the two species.

Allozetes africanus Balogh, 1958

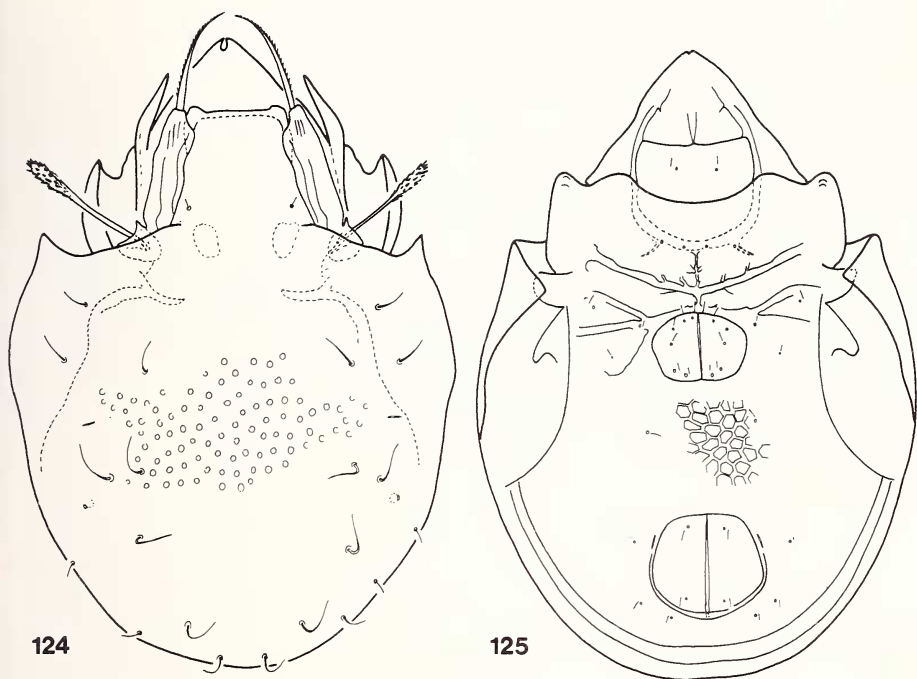
Measurements: Length: 287-297 μm , width: 203-208 μm .

Dorsal side (Fig. 124): Rostrum incised. Rostral setae thinner than in the following species and with fine bristles. Sensillus more strongly dilated at its end and no bristles or ciliae on its basal part. Notogastral sculpture not as strong as in *pusillus*, the foveolae are smaller and the distance between them is greater than the diameter of one foveola. Setae *ms* and *r*₃ situated very near to each other.

Ventral side (Fig. 125): Apodeme 2 and sejugal apodeme running farther from each other, so over a short distance sternal apodemes observable. Polygonal reticulation between anal and genital plates weaker than in the following species.

Material examined: Type series.

* Both species described by HAMMER stand much farther from it. *A. dispar* may belong to another genus (on the basis of the large areae porosae and the form of lamellae); *A. translamellatus* has a polygonate notogastral sculpture.



FIGS 124-125.

Allozetes africanus Balogh, 1958 — 124: dorsal side, 125: ventral side.

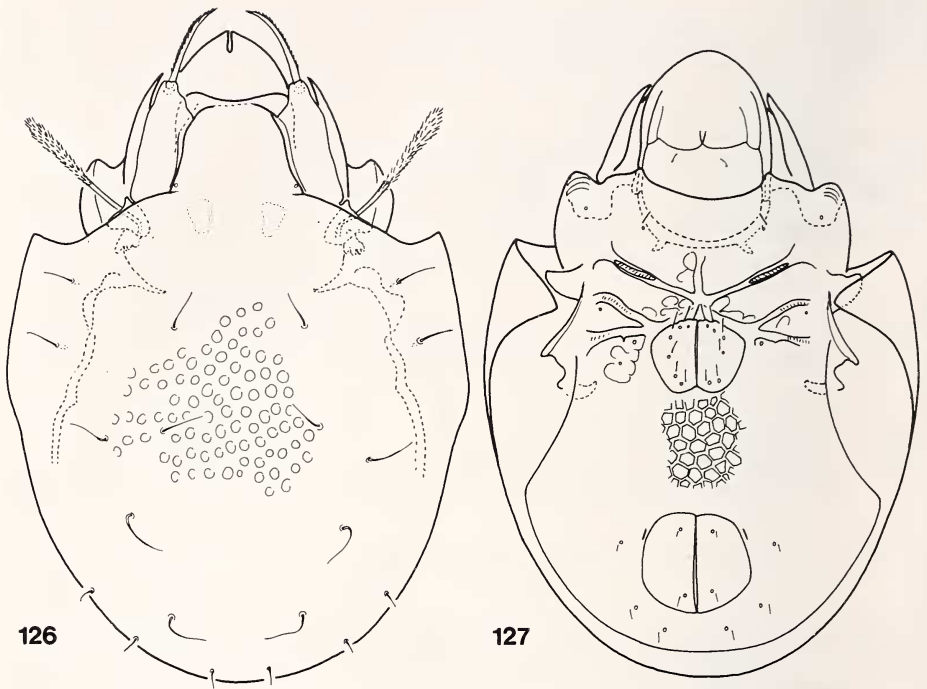
***Allozetes pusillus* (Berlese, 1913)**

Measurements: Length: 238 μm , width: 163 μm .

Dorsal side (Fig. 126): Rostrum with deep, but narrow incision medially. Rostral setae slightly dilated, distinctly barbed. Lamellae well developed, translamella only thinner medially, not interrupted. Sensillus gradually thickened distally and verticillately ciliate also on its basal half. Anterior part of notogaster smooth (see Fig. 126), the foveolae in the middle part are very large (one foveola is larger than the distance between any two). Setae r_3 and ms stand comparatively far from each other. Median pore present.

Ventral side (Fig. 127): Epimeral surface with some irregular spots. Apodemes 2 and sejugal apodemes connected with each other, no sternal apodeme observable between them.

Material examined: Pal-83/8: 1 specimen.



FIGS 126-127.

Allozetes pusillus (Berlese, 1913) — 126: dorsal side, 127: ventral side.

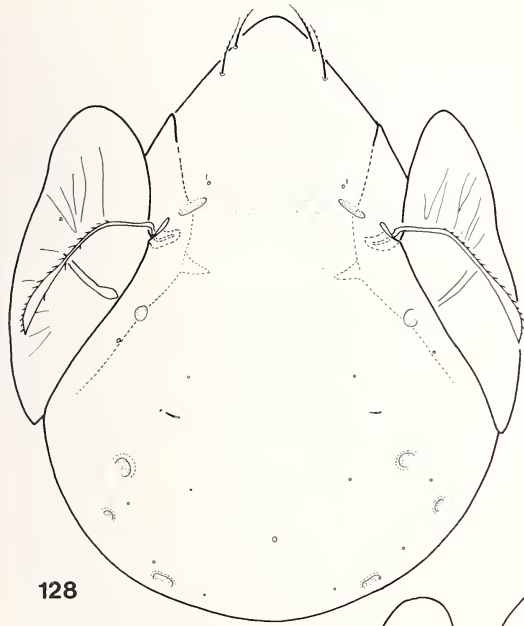
***Allogalumna incompleta* sp. n.**

Measurements: Length: 277-307 μm , width: 198-218 μm .

Dorsal side (Fig. 128): Rostrum normally rounded. Rostral and lamellar setae long, both pairs originating near to rostrum and well visibly ciliate. Interlamellar setae minute, hardly visible. Sensillus very long, directed backwards. Linea *L* typical of the genus (Fig. 129). Dorsosejugal suture absent. Areae porosae *Aa* and *A*₁ nearly equal in size, or *Aa* smaller than *A*₁. All fields of pori nearly round. An unpaired porus present in the posterior part of notogaster medially. Ten pairs of alveoli visible. Pteromorphae ornamented by fine, radially arranged lineae.

Ventral side (Fig. 130): Apodemes weakly developed, a short part of *ap. 2*, *ap. sej.* and *ap. 3* observable. Epimeral setae comparatively long, *3b* longest of all. Six pairs of genital setae present, three pairs originating on anterior margin much longer than the others. All other setae in the anogenital region very short. An unpaired area porosa postanal is present.

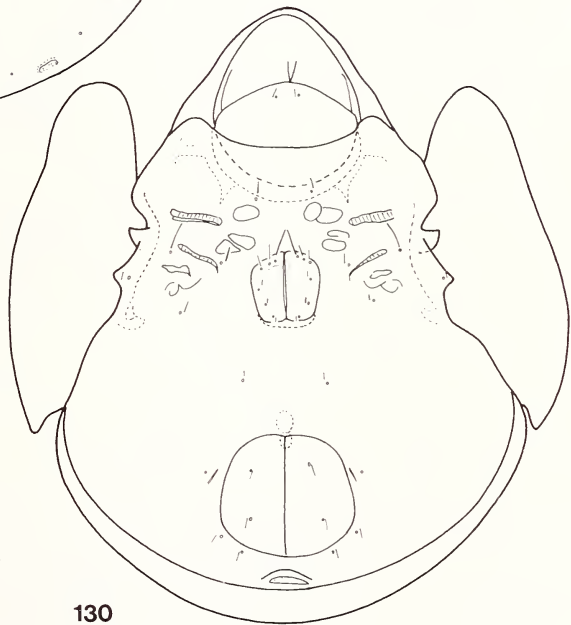
Material examined: Holotype: Pal-83/8, 8 paratypes: from the same sample. Holotype and 5 paratypes: MHNG, 3 paratypes (1027-PO-84): HNHM.



128



129

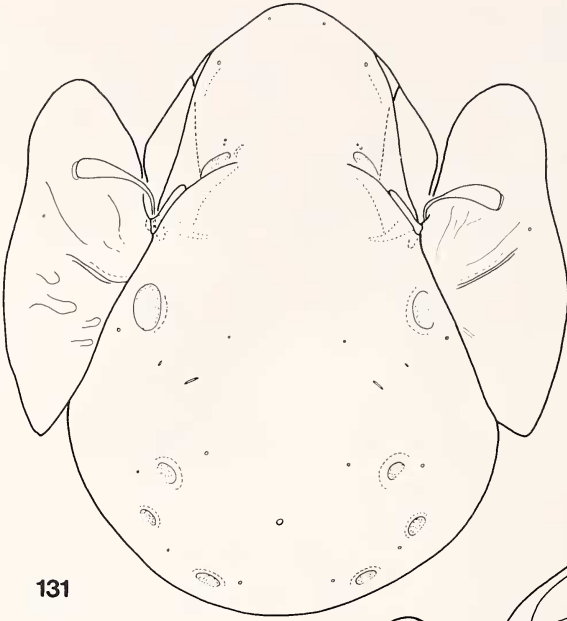


130

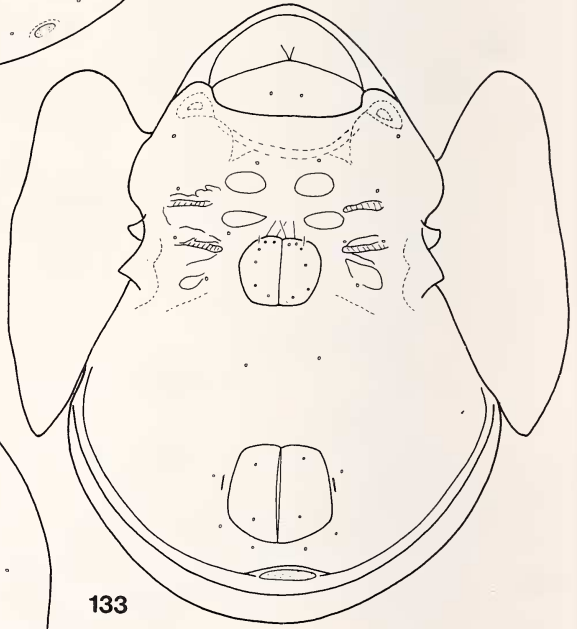
FIGS 128-130.

Allogalumna incompleta sp. n. — 128: dorsal side, 129: prodorsum from lateral view, 130: ventral side.

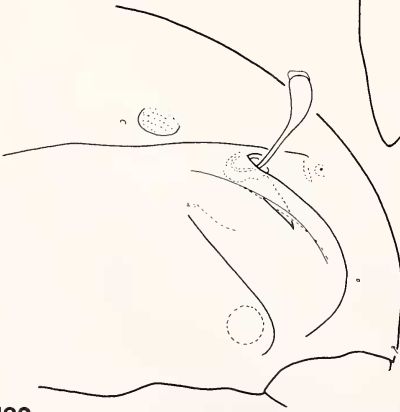
R e m a r k s : The species is well characterizable by the large sensillum and the shape of areae porosae. On the ground of this combination of characters the new species may be distinguished from all other congeners.



131



133



132

FIGS 131-133.

Pergalumna quadrimaculata sp. n. — 131: dorsal side, 132: prodorsum from lateral view, 133: ventral side.

***Pergalumna quadrimaculata* sp. n.**

M e a s u r e m e n t s : Length: 389-405 μm , width: 275-300 μm .

D o r s a l s i d e (Fig. 131): Rostrum very wide, rounded anteriorly. All setae of prodorsum completely reduced, represented only by their alveoli. Sensillus (Fig. 132) hatchet-like with a small hyaline band on its distal end, directed laterally. Dorsosejugal suture interrupted, its median part absent. Pteromorpha with some fine lines bordered by some large irregular fields. Four pairs of oval areae porosae present, *Aa* very large, twice greater than *A*₁.

V e n t r a l s i d e (Fig. 133): Apodemes and bordures very weakly developed. In the middle of epimeral region two pairs of large, oval spots present (hence the specific name), laterally some irregular spots also observable. All setae reduced, only a few alveoli visible: 2-0-2-1. Six pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal setae present, with the exception of the three anterior genital setae all reduced. Well-developed postanal areae porosae also present.

L e g s : All legs tridactylous.

M a t e r i a l e x a m i n e d : Holotype: Pal-83/8, 2 paratypes: from the same sample. Holotype and 1 paratype: MHNG, 1 paratype (1028-PO-84): HNHM.

R e m a r k s : The new species belongs to a group of species characterisable by

1. reduced setae on prodorsum,
2. interrupted dorsosejugal suture,
3. well dilated sensillus,
4. round areae porosae.

It is distinguished from all related species by the characteristic hatchet-like sensillus with a hyaline band on its distal end.

REFERENCES

- AOKI, J. 1965a. Oribatiden (Acarina) Thailand. I. *Nature Life SE Asia* 4: 129-193.
- 1965b. A Preliminary Revision of the Family Otocepheidae (Acari, Cryptostigmata) I. Subfamily Otocepheinae. *Bull. natn. Sci. Mus. Tokyo* 8: 259-341.
- 1980. A revision of the Oribatid Mites of Japan III. Families Protoplophoridae, Archoplophoridae and Mesoplophoridae. *Proc. jap. Soc. syst. Zool.* 18: 5-24.
- BALOGH, J. 1958. Oribatides nouvelles de l'Afrique tropicale. *Revue Zool. Bot. afr.* 58: 1-34.
- 1960. Oribates (Acari) nouveaux de Madagascar (1^{re} série). *Mém. Inst. scient. Madagascar* 14: 7-37.
- 1961. The Scientific Results of the First Hungarian Zoological Expedition to East Africa. 4. Acarina: Oribatei. *Annls hist.-nat. Mus. natn. hung.* 53: 517-524.
- 1963. Oribates (Acari) nouveaux d'Angola et du Congo (3^e série). *Publicões cult. Co. Diam. Angola* 68: 33-48.
- 1968. New Oribatids (Acari) from New Guinea. *Acta zool. hung.* 14: 259-285.

- 1970. New Oribatids (Acari) from New Guinea. II. *Acta zool. hung.* 16: 291-344.
 - 1983. A partial revision of the Oppiidae Grandjean, 1954 (Acari: Oribatei). *Acta zool. hung.* 29: 1-79.
- BERLESE, A. 1913. Acari nuovi. Manipoli VII-VIII. *Redia* 9: 77-111.
- 1920. Centuria quinta di Acari nuovi. *Redia* 14: 143-195.
- CSISZAR, J. 1961. New Oribatids from Indonesian Soils (Acari). *Acta zool. hung.* 7: 345-366.
- GRANDJEAN, G. 1936. *Microzetes auxiliaris* n. sp. (Oribatides). *Bull. Mus. natn. Hist. nat. Paris*, 2^e sér., 8: 138-145.
- HAMMER, M. 1962. Investigations on the Oribatid Fauna of the Andes Mountains. III. Chile. *Biol. Skr.* 13: 1-96.
- 1971. On some Oribatids from Viti Levu, the Fiji Islands. *Biol. Skr.* 16: 1-56.
 - 1972. Investigation on the Oribatid Fauna of Tahiti, and on some Oribatids found on the Atoll Rangiroa. *Biol. Skr.* 19: 1-65.
 - 1973. Oribatids from Tongatapu and Eua, the Tonga Islands, and from Upolu, Western Samoa. *Biol. Skr.* 20: 1-70.
 - 1977. Investigations on the Oribatid Fauna of North-West Pakistan. *Biol. Skr.* 21: 1-71.
 - 1979. Investigations on the Oribatid Fauna of Java. *Biol. Skr.* 22: 1-79.
 - 1981. On some Oribatid Mites from Java — Part II. *Acarologia* 22: 217-237.
 - 1982. On a collection of Oribatid Mites from Bali, Indonesia (Acari: Cryptostigmata). *Entomologica scand.* 13: 445-464.
- MAHUNKA, S. 1977. Neue und interessante Milben aus dem Genfer Museum XX. Contribution to the Oribatid Fauna of S.E. Asia (Acari, Oribatida). *Revue suisse Zool.* 84: 247-274.
- 1986. A survey of the family Carabodidae C. L. Koch, 1836 (Acari: Oribatida). *Acta zool. hung.* 32: 73-135.
 - 1987a. Neue und interessante Milben aus dem Genfer Museum Oribatids from Sabah (East Malaysia) I (Acari: Oribatida). *Archs Sci. Genève* 40: 293-305.
 - 1987b. Neue und interessante Milben aus dem Genfer Museum Oribatids from Sabah (East Malaysia) II (Acari: Oribatida). *Revue suisse Zool.* 94: 765-817.
- WALLWORK, J. A. 1961. Some Oribatei from Ghana VI. Some Members of the "Family" Eremaeidae Willmann 1931 (1st. series). *Acarologia* 3: 344-362.